United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Springfield Interagency Office, Northwest Oregon District
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http://www.blm.gov

1792A
DOI-BLM-N050-2017-0006-EA
Thurston Hills Non-Motorized Trails and Forest Management Project Environmental Assessment

February 4, 2020

Dear Citizen,

The BLM prepared an Environmental Assessment (EA) for the Thurston Hills Non-Motorized Trails and Forest Management Project in May 2018.

As a result of public comments, internal review, and working with project partners, BLM prepared a Determination of NEPA Adequacy (DNA), a concurrent FONSI, and Decision Record implementing Modified Alternative 4 of the May 2018 EA, which were published on ePlanning, BLM's National NEPA Registry website, on August 15, 2018. In September 2018, the Pedal Power Timber Sale was offered for sale and purchased by Seneca Sawmill.

In response to a September 18, 2019, opinion and order from the U.S. District Court for the District of Oregon (*Cascadia Wildlands and Oregon Wild v. Bureau of Land Mgmt.*, Case. No. 6:19-cv-00247-MC), I decided to issue a new February 2020 EA to disclose the potential increase of fire hazard and risk to adjacent communities, designate trails, and designate and preserve a Recreation Management Zone (RMZ) prior to timber harvest. Changes or additions from the May 2018 EA are highlighted in red font in the EA and include:

- revised project maps (attached Appendix A) to include designated trails and the proposed Recreation Management Zone;
- issues analyzed in detail on fire hazard and fire risk; and
- corrections of minor typos

You may access the EA on the ePlanning website for the Thurston Hills Project, at this link Thurston Hills Project website [the full url is https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=renderDefaultPlanOrProjectSite&projectId=75350].

I am making the February 2020 EA available for a 30-day public comment period that will close at the end of business (4:30 p.m.) on March 5, 2020. Please submit your comments by the close of the comment period by email to blm_or_thurstonhills@blm.gov, by mail addressed to Rebecca Brooke at the Springfield Interagency Office, Northwest Oregon District, 3106 Pierce Parkway Suite E, Springfield, Oregon 97477, or by fax to 541-683-6981. Please include "Thurston Hills EA Comments" in the subject line for faxed and emailed comments.

I would like to thank you all for your involvement in the development of this project.

Sincerely,

Rebecca Brooke

Upper Willamette Field Manager

THURSTON HILLS NON-MOTORIZED TRAILS AND FOREST MANAGEMENT PROJECT

ENVIRONMENTAL ASSESSMENT

February 2020

Document No.: DOI-BLM-N050-2017-0006-EA

United States Department of the Interior
OR/WA Bureau of Land Management
Northwest Oregon District, Upper Willamette Field Office
Lane County, Oregon

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1.0 Introduction

The Thurston Hills Non-Motorized Trails and Forest Management Environmental Assessment (EA) encompasses two separate actions presented for analysis by the Upper Willamette Field Office, Northwest Oregon District Bureau of Land Management (BLM): 1) a new non-motorized trail system for hiking and mountain biking; and 2) a timber harvest, named the Pedal Power Timber Sale. The actions are independent, in that they could be undertaken separately; each has independent purposes (utility). However, they are similar actions in that they have common geography and timing. The Council on Environmental Quality directs agencies to analyze actions together when the actions are similar in timing or geography, when doing so is the best way to assess the combined impacts of the actions (40 CFR §1508.25). Evaluating both actions in the same EA allows BLM to better assess the combined effects and to consider complementary design features to reduce potential conflicts among potentially competing uses.

The study area, as identified during project scoping, is the Willamalane Non-Motorized Trails Extensive Recreation Management Area (ERMA). The ERMA, designated by BLM's 2016 *Northwestern and Coastal Oregon Record of Decision and Resource Management Plan* (RMP), consists of 1,058 acres of BLM land in the following three sections: T18S R2W Section 1; T18S R1W Section 5; and T17S R1W Section 31 (see Figure 1). The RMP authorizes the development of non-motorized trails, specifically hiking and mountain biking trails, within the ERMA, *commensurate with the management of other resources and other resource uses* (RMP, p. 251). Other resource uses in the ERMA include timber harvest on lands designated by the RMP as Harvest Land Base (HLB), which comprises 55 percent of the acres in the ERMA. There are no existing developed trails or recreation facilities. However, the area is used by the public for dispersed recreation such as walking, horseback riding, hunting, target practice, and motorized quads (on existing roads/user-created trails).

The BLM established the ERMA in response to a request from the Willamalane Parks and Recreation District (WPRD) that BLM cooperate on a conjoined trail system. The WPRD already had conceptual plans for mountain biking and hiking trails in their 176-acre Thurston Hills Natural Area, west of the BLM ERMA Section 1. The combined trail network would provide new recreational opportunities for the growing Springfield and Eugene communities. As described in the ERMA Framework document (July 2016, p. 1), this area *"has potential for trail/site development in support of the Willamalane Park and Recreation District's $20 million bond measure passed in fall 2012. BLM lands located adjacent to 176 acres [of WPRD land] adjoining the 1872 Gray-Jaqua Homestead, between 75th and 79th streets, south of Highway 126, are being considered for recreation development*". Since 2018, WPRD has developed more than six miles of trails and a trailhead which provides restrooms, an information kiosk, picnic table, water, and a bike cleaning and repair station on WPRD lands.

When the BLM began planning for trail development in 2016, the Upper Willamette timber sale plan did not include timber harvest in the ERMA. However, the HLB lands in the ERMA are to be managed for sustained yield timber production, per the RMP. The stands in the HLB within the project area were thinned relatively recently, in the Cedar Flats Timber Sale, 2001-2005, consisting of 97 acres in Sections 1 and 31. Based on this history, the stands in the ERMA would

reasonably have been evaluated for another harvest within the next 10-20 years. Since trails constructed in the ERMA would be affected by timber harvest and vice-versa, the Upper Willamette Field Manager instructed the EA Interdisciplinary Team (IDT) to evaluate the potential for timber harvest in sections where trail development would take place.

At the time of scoping in April 2017, the BLM was studying the potential for trail development in Section 5 and had prepared a conceptual trail layout in that section. Since Section 5 is the largest section in the ERMA, the section was assessed to support approximately 11.7 miles of trail, and this extra trail mileage was enthusiastically supported by many public comments. At the same time, many public comments cautioned that the section had problems related to public entry and the narrow and winding Cedar Flats Road, which is the main paved (county) road to the section.

Section 5 is separated from the other sections in the ERMA by private property, and there are no over-land public easements that would allow for non-motorized trails connecting it to the other sections in the ERMA Sections 1 and 31. In 2017, BLM conducted outreach to the intervening private landowners to request public access easements, but landowners were not receptive. BLM's existing access point for vehicle entry (and timber sale harvest) is by an administrative access easement through private property on Cedar Flats Road meaning that BLM staff and BLM agents (contractors) have permission to enter. This agreement does not include public access. The IDT conducted some preliminary evaluations of new public entry points that would accommodate trail users without raising safety concerns associated with the only currently existing point of legal public access in the northwest corner of Section 5 from Cedar Flats Road. Because of the problematic geometry, terrain, and road size of Cedar Flats Road, the team recognized that formulating an appropriate public access plan would take substantial study and time. In order to expedite developing the trails that would readily connect to the WPRD system, the Field Manager decided to narrow the geographic scope of this project at this time to Sections 1 and 31 that adjoin the WPRD lands. Sections 1 and 31 therefore comprise the project area for this project.

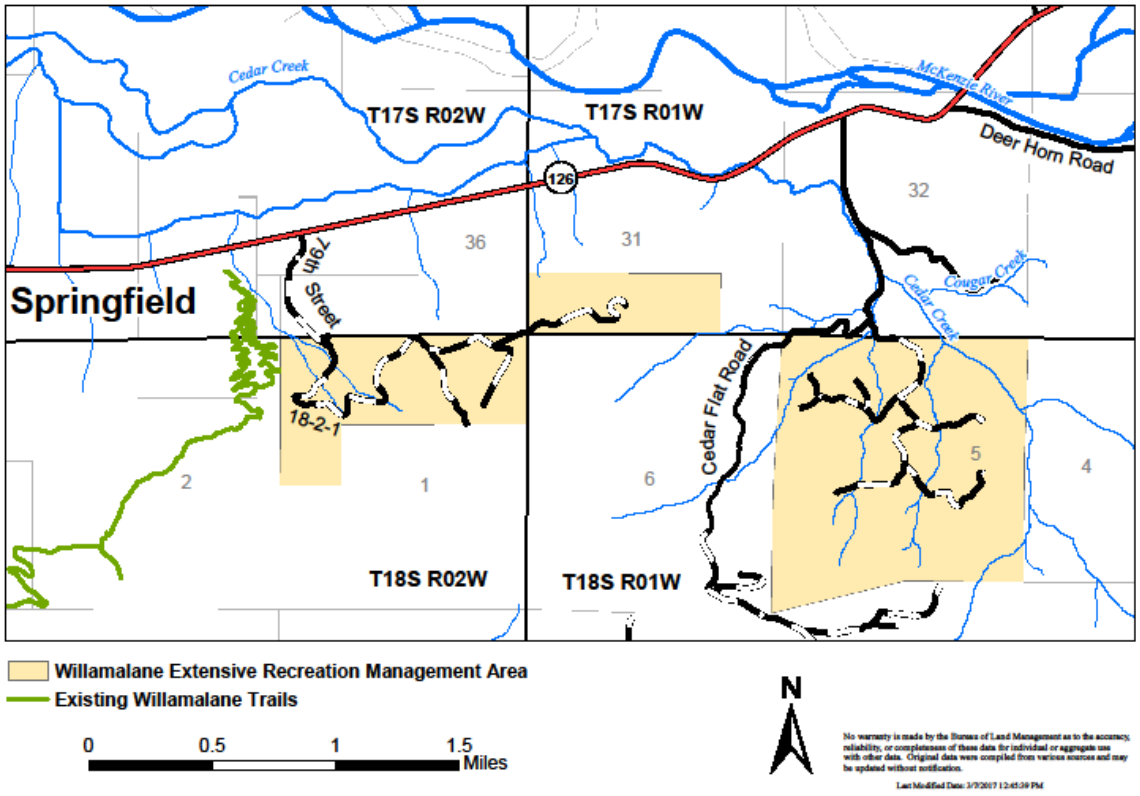
To manage the ERMA commensurate with management of other resources, the BLM needs to observe the RMP management direction for the underlying land use allocations (LUAs) in each ERMA. LUAs define the activities allowed, restricted, or excluded within the defined boundary of the particular LUA. The LUAs in the Willamalane ERMA include Harvest Land Base (HLB) – Moderate Intensity Timber Area (MITA), Riparian Reserve, Late-Successional Reserve, and District-Designated Reserves (which in the project area are existing roads and powerlines). Approximately 55 percent (581 acres) of the entire ERMA is allocated to HLB. On HLB lands, the RMP directs the BLM to implement timber harvest activities in a manner that, repeated over time, results in a sustainable harvest level (RMP, p. 296).

The RMP's management direction for ERMAs is to manage the ERMA in accordance with its planning framework (RMP p.88). The RMA frameworks prepared for each ERMA as part of the RMP process detail important recreation values, recreation and visitor service objectives, supporting management actions, and allowable uses. The BLM clarified the Forest Management section of the framework documents for all ERMAs on August 8, 2018 through plan maintenance. Plan maintenance added the following text to the beginning of the Forest Management section: "*Apply the following guidance to the extent it is consistent with the management direction for the underlying Land Use Allocation. Where ERMA designations*

overlap with the Harvest Land Base, implement actions as directed by the Harvest Land Base management direction and consider project design features that would minimize or avoid adverse effects to the recreational resources identified in the RMP's ERMA Planning Framework to the extent consistent with Harvest Land Base management direction." The addition of this text provided clarification consistent with the ROD/RMP, which states that "*the BLM will not defer or forego timber harvest of stands in the Harvest Land Base for reasons not described in the management direction or this appendix*" (ROD/RMP, p. 105). The BLM therefore designed and would implement the Thurston Hills Project per the HLB-MITA management direction, while incorporating project design features that would minimize or avoid adverse effects to the recreational resources identified in the Willamalane Non-Motorized Trails ERMA and would achieve the recreation objectives of the ERMA.

To thoroughly assess the effects of trail development and timber harvest on lands that authorize both actions, this EA evaluates alternatives that would implement both actions together and alternatives that would implement each action alone. In addition, the EA evaluates the No Action alternative, under which neither action would occur.

Figure 1. Thurston Hills EA Vicinity Map



1.1 Decision Factors

Decisions to implement actions described and analyzed under the alternatives will be made by the Field Manager (FM) for the Upper Willamette Field Office of the Northwest Oregon District BLM. The FM will make decisions based on the results of the issues analyses in the EA and on how well the alternatives respond to the purpose and need for the actions. As such, multiple factors discussed in the issues analyses will be used as decision factors.

Additionally, the FM will make decisions based on the interplay of effects - beneficial and adverse - from conducting the two proposed actions alone (independently), together or in sequence, as described by alternatives, particularly in terms of public investment.

The FM will also decide whether the analyses reveal a likelihood of significant adverse effects from the selected actions, which would require the preparation of an Environmental Impact Statement (EIS), whether adverse effects would be mitigated to reduce the likelihood of significance, and whether those effects have already been analyzed in an EIS to which the issue tiers.

1.2 Purpose and Need for Action

As previously stated, the Thurston Hills Non-Motorized Trails and Forest Management EA encompasses two separate actions presented for analysis: 1) a new non-motorized trail system for hiking and mountain biking; and 2) a timber sale. As these actions are independent, the BLM has constructed the below independent purposes and needs for each.

1.2.1 Non-Motorized Trail Development

This action would develop a non-motorized trail system for mountain biking and hiking, connected to the adjacent Willamalane Park and Recreation District (WPRD) trail system currently under construction.

Need: As part of the analyses of recreation resources for the 2016 RMP, the BLM identified recreation demands, opportunities, and scarcities for BLM-managed developed recreation within the RMP planning area (Proposed RMP/Final EIS, Volume 2, pp. 569-583). The BLM identified an unmet demand for hiking and mountain biking trails in close proximity (less than 60 minutes of driving) to the greater Eugene urban area (Proposed RMP/Final EIS, Volume 2, pp. 576-579). The 2016 RMP designated the Willamalane ERMA for hiking and mountain biking trails to address the scarcity and demand for these specific recreational opportunities in the Eugene area.

Purpose: *Manage Extensive Recreation Management Area in accordance with their planning frameworks (RMP, p.88).*

The framework document for the ERMA identifies the opportunity to connect BLM's future trail network in Sections 1 and 31 to a similar network of hiking and mountain biking trails that WPRD is developing on their adjoining 176 acres. There are currently no developed non-motorized trails within the Willamalane ERMA. The development of a hiking and mountain biking trail system in the ERMA would provide the new recreation

opportunity to meet the demand for hiking and mountain biking that the RMP designated these lands to address. The BLM has secured commitments from WPRD to collaborate in developing a hiking and mountain biking trail system in the ERMA, connecting to the WPRD trail system, to address the unmet demand for these recreational opportunities in the surrounding communities. Concurrently developing a conjoined trail network will allow more efficient use of facilities and provide a broader range of experiences for trail users. In accordance with the ERMA framework, the purpose of the trail development action is to develop a network of hiking and mountain biking trails adjoining the WPRD trail system.

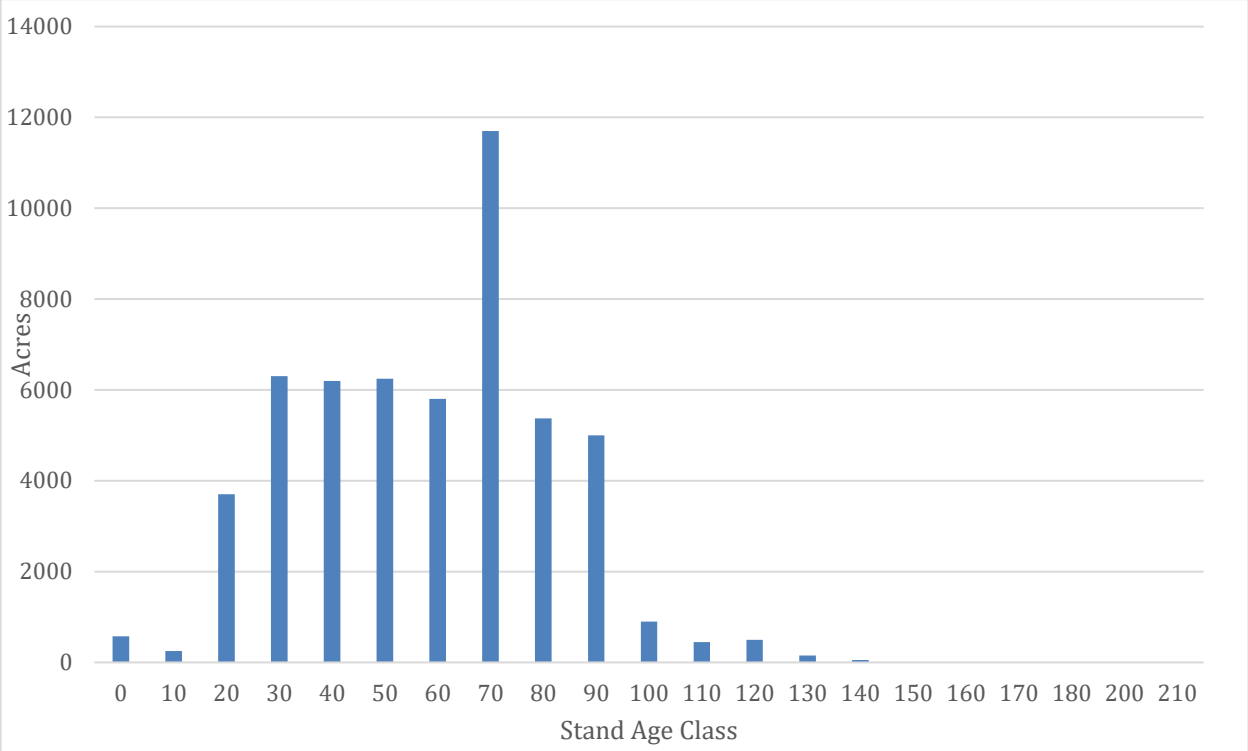
1.2.2 Timber Harvest

This action would implement a timber sale designed by the BLM, sold at auction to the highest bidder, and logged by the timber sale purchaser according to contract stipulations. There are two purposes for timber harvest in the project area, described below.

Need 1: ***There is a need to adjust the age class distribution within the Upper Willamette Field Office.***

Limited regeneration harvest on BLM-administered lands over the past 20 years has resulted in a disproportionate age class distribution across the HLB, as shown in Figure 2. Accordingly, the 2016 ROD/RMP (p. 59) includes direction to adjust the age class distribution in each sustained yield unit (SYU) to provide a variety of forest structural stages, distributed both spatially and temporally. In order to achieve this, each SYU needs to contain a well-distributed mix of age classes across the HLB.

Figure 2. Age class distribution of forest stands on lands administered by the Upper Willamette Field Office [Source: compiled from BLM Micro*Storms database 2019]



The lands administered by the Upper Willamette Field Office BLM are in the Eugene SYU. Only 490 acres, or 0.7 percent, of HLB acres in the Eugene SYU are in the 0-10 year age class. Within the Upper Willamette portion of the SYU, there are 438 acres (0.8 percent) in the 0-10 year age class. Within the Thurston Hills project area, there are zero (0) acres of HLB within the 0-10 age class and zero (0) acres in the 11-20 year age class (see Figure 2). The harvest method that achieves the redistribution of forest stands into the 0-10 year age class is regeneration harvest. The Field Office therefore needs to regenerate the stands in the project area to create more acres in the 0-10 year age class. If the Field Office does not redistribute older stands into the 0-10 year age class to create a well-distributed mix of age classes across the HLB, the cycle of growth and harvest expected for sustained yield in the RMP will not be possible.

***Purpose 1:* Conduct regeneration harvest to adjust the age class distribution in each sustained yield unit (RMP p. 59).**

In the RMP analysis, BLM modeled a repeated cycle of harvest and regrowth within the Harvest Land Base that does not decrease over time to achieve sustained-yield harvest levels (*Proposed RMP/Final EIS Volume 3, Appendix C, pp. 1183-1227).* In order to achieve this, each SYU needs to contain a well-distributed mix of age classes across the HLB. The BLM proposes regeneration harvest within the project area because the stands in the project area are 69 years old (average). These stands fall within the 70-year age class,

which has the most acreage of all age classes in the Field Office, almost twice as much as any other age class, as illustrated in Figure 2. The regeneration harvest of these stands would achieve a redistribution of stands into the 0-10 age class to better adjust the currently un-balanced age class distribution within the Field Office.

Need 2: ***There is a need for the Upper Willamette Field Office to contribute to the Eugene sustained-yield annual declared Allowable Sale Quantity.***

The Eugene sustained-yield unit (SYU) has an annual declared Allowable Sale Quantity (ASQ) volume of 53 million board feet (mmbf) (RMP, p. 6). The BLM can only achieve this annual ASQ target by harvesting timber within the 65,800 acres of the HLB contained in the Eugene SYU. The Upper Willamette Field Office manages 80 percent (52,400 acres) of the Harvest Land Base within the Eugene SYU. A substantial portion of commercial harvest needs to be conducted annually, within the Upper Willamette Field Office to achieve the Eugene SYU's annual ASQ target, and to ensure that over a decade of implementation, the actual volume of timber that the Eugene SYU offers for sale is within 20 percent of total volume (53 mmbf), summed over the entire decade.

Purpose 2: ***To implement commercial harvest to produce timber and contribute to the attainment of the declared Allowable Sale Quantity (ASQ) (RMP, p. 59).***

The BLM proposes all acres analyzed for commercial harvest in this environmental assessment for contributing to the annual declared ASQ for the Eugene SYU. The Eugene SYU's annual achievement of its ASQ is dependent upon offering for sale timber volume with individual timber sales, which taken together, total the SYU's contribution to sustained-yield timber production. In the RMP analysis, the BLM modeled a variety of silvicultural practices to keep forest stands in a cycle of harvest and regrowth to ensure the BLM could manage for sustained-yield harvest over the long-term. The timing sequence of interim silvicultural treatments was expected to vary based on the current and the desired future condition of the stand (2016 Proposed Resource Management Plan/Final Environmental Impact Statement for Western Oregon [PRMP/FEIS or FEIS], Appendix C, pp. 1183 and 1189-1193). The BLM expects commercial harvest within this project area to contribute to the annual declared ASQ for the Eugene SYU. The BLM previously selected Modified Alternative 4 from the May 2018 EA, and the Pedal Power Timber Sale was sold in FY 2018, contributing 4.0 mmbf to the ASQ for the Eugene SYU. Selection of Alternative 3 or 5 would contribute additional volume, which would count toward FY 2020. Selection of the No Action Alternative or Alternative 2 would result in lost ASQ. Deferring commercial harvest in these stands now would forego the opportunity to contribute timber volume toward meeting the declared ASQ of 53 million board feet for these years.

1.3 Conformance

The BLM signed a Record of Decision (ROD) approving the *Northwestern and Coastal Oregon Record of Decision and Resource Management Plan* (2016 ROD/RMP) on August 5, 2016. The Upper Willamette Field Office designed this project to conform to the 2016 ROD/RMP, which is the authorizing RMP for the Northwest Oregon District and for this project. The BLM does not require additional authorities based on other federal laws or regulations to implement the proposed actions included in this EA.

During development of the proposed actions, the BLM applied RMP management direction in order to define the allowable activities and management within the project area. Table 1 shows the classification of acres within the total 394-acre project area resulting from this process, including RMP-defined land use allocations as well as acres within the HLB deferred due to project-specific conditions.

Table 1. Land Use Allocations and Deferrals for Pedal Power Timber Sale

District Designated Reserve (Roads, Powerline, Fragile soils)	17
Late-Successional Reserve	12
Riparian Reserve	165
Deferred – Bureau Sensitive Plant Sites (HLB)	29
Deferred – Operational (HLB – Section 31)	6
Harvest Area (Alternative 3) (HLB)	165

1.4 Scoping and Public Involvement

The BLM offered a 30-day public comment period during scoping which began March 17, 2017, and ended April 30, 2017. The BLM provided the following notifications to the public and recognized Tribes during project scoping:

- Posted the scoping notice with the scoping meeting announcement and project map on the BLM's ePlanning website on March 17, 2017;
- Emailed the posting of the scoping notice with the scoping meeting announcement on ePlanning to the list of people and organizations interested in NEPA projects of the Upper Willamette field office and to parties interested in trail development previously identified by the WPRD;
- Mailed postcards to landowners within approximately ¼ mile of the project area to notify them of the project, invite them to the April 13, 2017, public meeting, and inform them of the availability of the scoping notice on BLM's ePlanning website;
- Distributed a press release announcing the project scoping period and public scoping meeting; and
- Sent coordination letters to the Confederated Tribes of Siletz, the Confederated Tribes of Grand Ronde, and the Confederated Tribes of Warm Springs, inviting them to consult. The BLM did not receive a response from any of the Tribes.

The BLM held the public scoping meeting in cooperation with the WPRD on April 13, 2017. Thirty seven (37) individuals/families, one (1) business, and one (1) organization submitted comments during the scoping period, via comment forms at the scoping meeting, emails, and letters. Comments fell into six general categories: 1) types of recreational uses desired or not desired (hiking, biking, equestrian); 2) vehicular traffic and access to trail system; 3) safety and privacy of adjacent landowners and trail users; 4) recreational amenities and trail experiences; 5) economic impact of trail system to the community; 6) vegetation and timber treatments (including use of chemicals).

Due to the potential sensitivity of new recreational uses close to residential lands, the BLM engaged a public involvement specialist (contractor) to conduct more in-depth public engagement for this project. In September 2017, the contractor conducted in-person and phone interviews with 11 stakeholders identified during scoping as having a vested interest in the project. These stakeholders represented adjacent and nearby property owners, user groups, partner agencies, and conservation organizations. Stakeholders were asked to share their thoughts on different aspects of the project, including any concerns and ideas they had for design and management. The BLM considered the comments and issues identified from the interviews during project development and EA analysis, similar to the consideration of issues raised during the scoping period.

The BLM Interdisciplinary Team (IDT) reviewed all comments and listed the issues of concern as well as alternatives suggested by commenters. The IDT also considered internally-generated (BLM) issues and alternatives based on environmental conditions in the project area. Stemming from this external and internal scoping process, the BLM identified a range of issues to study in the EA and a range of alternatives that would meet the project purposes and needs.

After developing a preliminary range of alternatives and issues responding to public comments, the BLM held a public open house on November 7, 2017, to solicit input on these alternatives and on the list of issues BLM proposed to consider in the EA. Twenty-eight (28) people attended the meeting. Four (4) people submitted comment forms and attendees provided over two dozen notes on the display maps and flip charts used to capture comments at the meeting. Comments primarily addressed: 1) specific features to include or avoid in trail design; and 2) concerns about privacy, trespass, and wildfire for property owners close to the trail.

The BLM prepared an EA and Preliminary Finding of No Significant Impact (FONSI) and made it available for public comment on April 23, 2018. During the 15-day public comment period, the BLM received six (6) comment letters. After consideration of public comments and internal review, the BLM prepared a modified May 2018 EA and accompanying Decision Record, and made them available for public comment on May 30, 2018.

After consideration of public comments, internal review, and working with project partners (Willamalane Parks and Recreation District), the BLM prepared a Determination of NEPA Adequacy (DNA), a FONSI, and Decision Record implementing Modified Alternative 4 of the May 2018 EA, which were published on ePlanning, BLM's National NEPA Registry website, on August 15, 2018. In September 2018, the Pedal Power Timber Sale was offered for sale and purchased by Seneca Sawmill. Road work for Modified Alternative 4 was completed in spring 2019.

In response to a September 18, 2019, opinion and order from the U.S. District Court for the District of Oregon (*Cascadia Wildlands and Oregon Wild v. Bureau of Land Mgmt.*, Case. No. 6:19-cv-00247-MC), the BLM is issuing and making available for public review and comment this February 2020 EA to add analysis of the effect on fire hazard to adjacent communities, designate trails, and designate and preserve a Recreation Management Zone (RMZ) prior to timber harvest.

1.5 Issues

Resource specialists conducted field surveys and reviewed the proposed action relative to effects on a broad range of resources in the project area to determine whether project effects would cause resource concerns or go beyond existing legal authorities (federal laws and regulations). BLM resource specialists found no resource concerns other than those identified as issues in this EA. The BLM has complied with Section 106 of the National Historic Preservation Act by assessing the presence and potential effects of the proposed actions on historic and archaeological resources. The BLM conducted a cultural resource inventory of the project area in July 2017. No cultural resources were identified, so no effects on these resources are anticipated from the proposed actions.

In the context of an environmental analysis, an issue is a point of disagreement, debate, or dispute with a proposed action based on some anticipated environmental effect. For the purposes of the BLM's NEPA analyses, an issue:

- has a cause and effect relationship with the proposed action or alternatives;
- is within the scope of the analysis;
- has not been decided by law, regulation, or previous decision; and
- is amenable to scientific analysis rather than conjecture.

The IDT evaluated the public comments submitted during scoping, discussed internally generated concerns from resource specialists, and identified issues. The BLM is not required to analyze all issues. The BLM evaluates issues in detail when detailed analysis would be necessary to: a) make a reasoned choice between alternatives; and b) determine the level of significance of potential effects.

Based on this process, this EA includes issues presented in detail (in Section 3) and issues evaluated but eliminated from detailed analysis (in Section 1.6). Issues presented in detail in Section 3 include the following:

1. *How would the trail development plan provide for different recreational experiences and levels of difficulty for mountain biking and hiking?*

2. *What are the costs and revenues associated with road construction, trail building, and timber harvest?*

3. *How would proposed timber harvest in the Thurston Hills project provide Allowable Sale Quantity (ASQ) timber volume for the Eugene SYU? How would the volume affect the ability to meet ASQ volume targets for the Eugene SYU?*
4. *How would proposed regeneration harvest change the age-class distribution within the Upper Willamette Field Office (UPW) and the Eugene Sustained Yield unit (ESY)?*

5. *How would trail development, timber harvest, and reforestation affect fire risk?*

6. *How would trail development, timber harvest, and reforestation affect fire hazard?*

1.6 Issues Considered, but Eliminated from Detailed Analysis

Issues considered but eliminated from detailed analysis are described below. These include concerns raised by the public during scoping. The IDT evaluated these issues and, in some cases, conducted substantial analysis before concluding that detailed analysis was not warranted. The BLM uses the following criteria to eliminate issues from detailed analysis:

1) BLM has conducted prior analysis of the issue on similar projects in other EAs or EISs which adequately inform the decision maker about the potential effects of this project; and
2) BLM determined that there would be negligible effects from the project and thus no potential for significant effects, and that there would be no substantial differences among the alternatives to inform the decision maker.

How would proposed timber harvest and associated activities affect the spread and introduction of invasive/non-native plant species?

A public scoping comment expressed concern that Thurston Hills project activities would spread invasive plant species. The commenter also requested that the BLM focus on removing non-native plants as a part of the project. The BLM considered the effects of the proposed timber harvest and associated activities on the establishment and spread of invasive plants, which is relevant for Alternatives 3, 4, and 5.

The BLM surveyed for invasive weeds in the project area and found eight species in the proposed units and the adjacent roads and power line rights-of-way: false brome (115 acres infested), invasive blackberry species (54 acres infested), and Scotch broom (15 acres infested). The primary vector for spread of these weeds is vehicle travel along the roads in the project area, which are open to public access. Additionally, the power line rights-of-way adjacent to the project area are not managed by the BLM and are also infested by invasive weeds. These areas would remain a source of weed seed that would spread into the project area. The high rates of invasive species coverage in the project area reflect the influence of adjacent development (urbanization), including the powerline corridor.

The BLM would implement two Project Design Features to prevent the introduction of new invasive plant species to the project area and to control the spread of existing invasive plants: 1) before entry to the site, all roadside brushing equipment and any logging and construction equipment that would be used off-road would be cleaned to remove soil, vegetative matter or other debris that could contain noxious weed seeds; and 2) areas of disturbed soil resulting from project activities along roads would be seeded with native plant species where necessary to control invasive plant species.

The BLM completed a Noxious Weed Risk Assessment for each alternative as required by BLM weed management policy (USDI, 1992). This policy calls for weed population monitoring and control efforts, as well as appropriate project design features to control the spread of existing noxious weeds and to prevent the introduction of new invasive plant species (USDI, 1992). Based on this assessment, the Upper Willamette Field Office would conduct at least three consecutive years of monitoring and control (slashing, removal) of invasive plant species in the project area after project implementation.

After any regeneration harvest, it is likely that existing invasive plant infestations would grow larger and that invasive plants would spread into areas where surface soils were disturbed during harvest operations. Based on BLM's experience on other projects, invasive plants tend to increase after harvest, with the increased levels persisting up to about 30 years, at which point planted conifers and other shade-tolerant native vegetation outcompete the invasive species. Weed levels then decrease. Due to the current prevalence of weeds, BLM reforestation efforts after harvest would include proactive cutting back of invasive shrubs to promote growth of the planted seedlings (see description of *Post-Harvest Slash Disposal, Site Preparation, and Reforestation* in Section 2.3.2). These extra efforts, in addition to BLM's other monitoring and control actions, would dampen the increase of invasive species, with rates of infestation remaining high, similar to existing conditions.

Important habitats such as LSR and Riparian Reserves would be minimally disturbed by project activities, and Bureau sensitive species sites would not be treated/disturbed, so the ramifications of invasive species on more intact habitats would be negligible. All of the harvest alternatives would be similar in their effects. Since there would be no substantive changes in noxious weed risk from the proposed action and no substantive difference among the alternatives to inform the decision, the BLM did not analyze this issue in detail.

The BLM is currently conducting analysis of weed treatments in the *Integrated Invasive Plant Management EA*. Upon BLM's decision to implement any of the weed treatment alternatives analyzed in that EA, the BLM may implement such treatment methods in the Thurston Hills project area as part of the ongoing weed control program. The BLM has determined that implementation of any of these future weed control methods would not change the overall analysis results in the Thurston Hills EA.

How would trail development affect trespassing, litter, vagrancy, privacy, traffic, and traffic noise for residences on 79th Street and other residences adjacent to BLM land?

Concerns for the safety and privacy of adjacent landowners were frequently mentioned in public comments pertaining to trail development. These concerns encompassed the possibility of increased trespassing, litter, vagrancy, shooting, privacy (relative to residential uses), traffic, and traffic noise on the access roads into the ERMA. This issue applies to only the trail action, which occurs under Alternatives 2, 3, and 4.

Trespassing, Litter, Vagrancy, Shooting, Privacy: During scoping and stakeholder outreach, landowners adjacent to the ERMA described that they see a variety of undesirable uses in Sections 1 and 31, including illegal dumping (household trash), carcass disposal (from hunting and domestic animals), late night party debris (food wrappers, beverage bottles, and bonfires), and recreational shooting (appliances, cans and bottles, and shell casings). They also reported destruction of private property (cut fences) and trespass of off-highway vehicles (OHVs) from BLM land. The commenters were concerned that these issues would become more prevalent with the creation of the trail system, which would bring more people into the area.

The BLM would not expect these types of activities to increase in the project area as a result of trail development. There is a substantial body of research about the effects of trails on safety and crime rates that supports this conclusion and suggests that undesirable activities may actually decrease as a result of trail development. Relevant research results include the following:

- Residents living adjacent to greenways in Denver regarded trails as an amenity (57% of survey respondents lived in their homes prior to trail construction). The study found no public safety issues directly linked to the trail (The Conservation Fund and Colorado State Parks, 1995).
- Nine years after the development of a bicycle/pedestrian trail in Santa Rosa, California, 64% of survey respondents felt the trail had increased the quality of life in the neighborhood, with another 13% saying "no effect". The study showed neither increased crime nor decreased property values due to trails, and 23% of survey respondents believed the trail would make their home sell for more. (Murphy, 1992).
- A study of greenways adjacent to residences in North Carolina found that most residents felt satisfied with the greenways and that problems were minimal (Tedder, 1995). This study also noted that "noise and loss of privacy problems may be ameliorated by increased buffers between the greenway and home, while open wood rail fences may more clearly signify property lines and reduce trespassing."
- The most comprehensive survey, published by the Rails-to-Trails Conservancy, covered 7,000 miles of trail with 45 million users: approximately 5 million users on 332 urban trail miles; 14 million people on 1,100 suburban trail miles; and 26 million users on 5,282 rural trail miles. (Tracy and Morris, 1998). This study found the following:
    - *Only 3% of these trails reported any crimes against persons (assaults, muggings, rape, and murder); of the 3% of trails that reported a crime against a person, urban trails had a higher rate of crime than suburban ones. Crime against persons on rural trails was negligible.*
    - *Burglary near trails was extremely rare, more so than other crimes. Only 4 burglaries were reported in homes adjacent to 7,000 miles of rail trails in 1996 and 3 of those 4 were reported in rural areas. There was no evidence that these 4 crimes were a result of the nearby trail.*
    - *Minor crimes were reported on trails, but crime rates were lower on trail networks than the rates for the overall region in which they were located: 4% of trails reported trespassing; 14% reported graffiti; 24% reported littering; and 18% had unauthorized motorized use. There was no difference between urban, suburban, and rural areas related to incidents of littering and sign damage.*
    - *Whether in urban, suburban, or rural environments: the more people present, the less likelihood of criminal activity.*

During and after trail construction, the BLM would implement the following management measures to enhance security through design, education, and enforcement in the ERMA:

- BLM would block roads at key locations to separate the non-motorized trails from vehicular traffic, which would have the secondary benefit of discouraging trespass onto adjacent private property. Under Alternative 2, a barrier or gate would be installed at the junction of Road 18-2-1 with 18-2-1.1. Under Alternatives 3 and 4, a gate would be installed on Road 18-2-1 where it enters Section 31, the junction of Road 18-2-1 with 18-2-1.1 would be blocked by a barrier or gate, and Spur A would be blocked.

- BLM would work with adjacent landowners to improve boundary demarcations and trespass/vandalism enforcement, upon request
- BLM law enforcement officers would patrol the ERMA via 79th Street and Road 18-2-1 more frequently and continue to issue citations for activities prohibited by BLM, by Lane County ordinance, and by state and federal law, including firearms violations. Officers would provide their cellphone contact numbers to residents upon request.
- BLM would work with our partner WPRD and trail user groups (who have already verbalized a commitment to help) to organize regular trail maintenance and trash pick-up
- BLM would advise adjacent landowners, upon request, about landscaping for the purpose of vegetative screening on their property. Vegetative screening (e.g., clustered plantings of native trees and shrubs) provides visual barriers and helps attenuate sound.

Privacy (relative to residential uses): During trail layout, trail routes were placed as far as possible from adjacent residential structures and use areas, usually far enough that trails would be out of sight of residential use areas. This was not possible in all cases due to environmental constraints, including the presence of rare plants and steep fragile slopes. The trail would be visible from the property lines of three residential properties adjacent to the trail in Section 31. These properties are close enough to the proposed trail to be affected by noise and/or visual effects from trail users. These effects would include audible noise such as the whirring of bicycle wheels, voices, and visual sightings of recreational users.

How these effects would be perceived would vary depending on the owner's distance from the trail, hearing acuity, and the amount of screening (vegetation or structures) between the trail and the residence. There is already a well-worn user-created trail open to the public and actively used by OHVs approximately the same distance as the proposed trail away from two of these residences. As such, these residences are currently exposed to occasional noise and visual sightings of trail users on user-created trails, similar to what would be expected from the trail development alternatives. These residences have space on their private property between the proposed trail and their personal use areas for the installation of screening vegetation if they were to choose to do so. The third residence is set back from the trail and has screening vegetation on their property, but the timber harvest action would remove trees, which could increase their exposure to the trail. All of the trail alternatives were designed to provide as much forested corridor on BLM land as possible: in Alternatives 2 and 4 the trail route would be located within the existing forest (not to be harvested) and Alternative 3 would incorporate aggregate retention along the trail near the third residence to provide a forested corridor for the trail to the extent possible.

Traffic and Traffic Noise: The BLM trail development would not result in vehicular traffic on 79th Street because BLM is not proposing trail heads, parking facilities, or other amenities accessible from 79th Street or any other local roads. The proposed trail network would be accessible by hikers and bikers from its connection to the adjacent WPRD trail system, which provides parking, and trailhead amenities. Therefore, none of the trail alternatives would cause changes in traffic and traffic noise on 79th Street.

The potential effects of the trail development alternatives would be similar because there would be no difference in the expected number or type of users among the alternative trail plans and the BLM would apply the above management measures to all of the alternatives equally. Since the

BLM anticipates minor effects and no substantive differences among the alternatives, further analysis would not inform the decision maker and BLM did not analyze this issue in detail.

How would regeneration harvest affect the development of mature and late-successional forest characteristics like tree mortality, gaps, understory development, biomass accumulation, and snag creation? How would the changes affect habitat for late-successional species and the northern spotted owl?

A public scoping comment expressed that regeneration harvest should not occur as a part of the Thurston Hills project because of a current deficit of mature and late-successional forest structural stages in the region, with associated negative effects on northern spotted owl. This issue applies to only the harvest action, which occurs under Alternatives 3, 4, and 5.

The BLM previously analyzed this issue in the PRMP/FEIS, to which this EA tiers. Relevant findings from surveys in the Thurston Hills project area and from the PRMP/FEIS are as follow:

- There are no known spotted owl sites in the Thurston Hills project area. The BLM conducted spotted owl protocol surveys in the project area in 2016 through 2019 and will continue to do so through project implementation to ensure that spotted owls are detected if they move into the project area. If future surveys detect spotted owls, the BLM would re-evaluate the project actions and retains the authority to halt and/or modify project activities if needed to avoid take.
- There would be no effects on spotted owl recovery beyond those analyzed in the PRMP/FEIS, to which this EA is tiered. The PRMP/FEIS analyzed the effects on spotted owl of allocating lands, including those in the project area, to the HLB. That analysis, incorporated into this EA by reference, identified that implementation of the PRMP would meet the four habitat-dependent conservation needs of the northern spotted owl described in the Recovery Plan and would implement the four applicable Recovery Actions (PRMP/FEIS Volume 2, p. 928). As such, the FEIS concluded that the BLM would contribute to self-sustaining northern spotted owl populations in the western Cascades during the next 50 years if the U.S. Fish and Wildlife Service undertakes a barred owl control program (PRMP/RMP pg. 928).
- There would be no effects on the amounts of late-successional forest structural stages or snags and down woody material available across the PRMP/FEIS decision area beyond those analyzed in the FEIS, to which this EA is tiered. The PRMP/FEIS analyzed the effects on forest structural stages and snags and down woody material of allocating lands, including those in the project area, to the HLB with the expectation of timber harvest, including regeneration (PRMP/FEIS Volume 1, pp. 307-337). That analysis, incorporated into this EA by reference, identified that as the BLM implements the RMP, the following would occur:
    - The amount of forest with late-successional characteristics (Mature Multi-layered Canopy or Structurally-Complex structural stages) in the HLB would decrease from 2013 to 2033, return to current levels by 2053, and then increase above existing levels in around 50 percent of the HLB in 100 years (PRMP/FEIS Volume 1, pp. 320-326)
    - The variable-retention regeneration harvesting directed by the RMP (and applied to the proposed timber harvest in the Thurston Hills project) would produce

heterogeneous, multi-layered stands with structural legacies (PRMP/FEIS Volume 1, pp. 320-327)

- Habitat for species associated with snags and down woody material in younger stands would increase (FEIS Volume 2, p. 843)
- Habitat for species associated with legacy structures in older stands would have an increase in habitat under the RMP due to the increased acreage of reserves (Late Successional Reserve and Riparian Reserve) at the landscape level, resulting in increased development of Mature and Structurally-complex habitat that contain snag and down woody material legacy structures (PRMP/FEIS Volume 2, p. 843)

The Thurston Hills project would be consistent with these effects on forest structural stages because the proposed regeneration harvest follows RMP management direction, including the features detailed in Section 2.3.2. The affected stands would develop through the Early Successional, Stand Establishment, Young High Density, and Mature Multi-layered Canopy structural stages, as anticipated by the PRMP/FEIS (Volume 1, p. 318), before the BLM once again conducts harvest. As such, BLM's prior analysis of this issue in the PRMP/EIS, to which this EA tiers, adequately informs the decision maker about the potential effects of this project, so this issue was not analyzed in detail.

How would road construction, timber hauling, and trail building affect sediment yield entering streams, in tons per year?

During public scoping, a commenter expressed concern that new roads and trails could cause erosion and thus water quality problems from sedimentation. This comment applies to all the action alternatives; roads would be constructed under Alternatives 3, 4, and 5 and trails would be constructed under Alternatives 2, 3, and 4.

This EA did not analyze this issue in detail because there is no potential for significant effects beyond those previously analyzed in the PRMP/FEIS, to which this EA tiers, and no differences among alternatives to inform the decision maker. Relevant findings from the BLM hydrologist's quantitative analysis of the Thurston Hills project area and from the PRMP/FEIS are as follow:

- The FEIS concluded that BMPs are effective and that BMPs protect water quality; therefore, prescription of applicable BMPs are required design components in all forestry related projects (USDI BLM FEIS 2016 p. 404) and implemented on BLM timber harvest projects. For the Thurston Hills project, proposed new roads were located on ridgetops, benches, and stable areas (BMP R01). New roads were also located to minimize the number of stream crossings (BMP R02) and new roads, trails, and renovations would include adequate drainage (e.g., cross-drains, rolling dips, lead-outs), such that flows would not become concentrated to result in gullying or increase the risk of landslides (BMPs R10, R37). [Note: the proposed new trails weave in and out of Riparian Reserve to take advantage of canopy conditions; BMPs listed in Appendix B would minimize erosion and sedimentation from trails.] Recent BLM BMP Implementation and Effectiveness Reports (USDI BLM 2016) show that these types of road design BMPs are effective in preventing sediment delivery on the Northwest Oregon District. The BLM would apply these design features and a suite of other BMPs on the Thurston Hills

project that would minimize sediment delivery from surface erosion (see a list of key PDFs in the EA Appendix B).

- The PRMP/FEIS (Volume 1, pp. 405-406) concluded that the increases in sediment delivery resulting from implementation of the RMP across the RMP planning area would be inconsequential compared to the existing sediment delivery. The 2016 RMP EIS anticipated a one percent increase of sediment within the sediment delivery distance (FEIS Volume 1, p. 406), corresponding to an increase of approximately 165 tons per year for new roads across the entire planning area
- The Thurston Hills project area is within the Cedar Creek drainage area. The BLM's quantified analysis for the project estimated that the background sediment contribution from existing BLM controlled roads is approximately 46 tons of sediment per year to the Cedar Creek drainage area. The sediment delivery that would result from trail building, road construction, and timber hauling was found to increase the total fine sediment yield amount by about three (3) tons per year, or approximately 6% above the existing road contribution. Of that, about 2.5 tons (5%) was due to the increase during timber hauling. The remaining one percent (0.5 tons/year) would be from the construction and use of the mixed-use trail system.
- Annual sediment yield is highly variable in Pacific Northwest mountain streams, sometimes varying annually by one or two orders of magnitude. Actual yield depends on inherent watershed characteristics, patterns, and intensity of weather and disturbance. The temporary increase in sediment contribution from road and trail construction in the Thurston Hills project area would have negligible effects on water quality and sediment in project area streams because the turbidity would be short-lived and low intensity relative to background sediment from existing roads. The small increase would not have persistent effects within channel substrate or alter ecological functions. Increased turbidity from timber hauling would be intermittent as dictated by the haul schedule and spread out over an anticipated two wet seasons. The BLM would suspend haul operations where the haul road surface is deteriorating and turbid runoff is likely to reach streams (Hydrology BMP incorporated into project, see EA Appendix B). An increase of approximately 0.5 tons (1%) in sediment would result from recreation trail construction. This would also have a negligible effect on water quality relative to background existing road contribution, and, therefore, there would be no substantive differences among alternatives.
- The BLM hydrologist determined the relative importance of road and trail sediment yield by comparing it with the baseline natural sediment yield. In the Cedar Creek drainage area, soil creep (the slow downward movement of the soil mantle due to gravity) is the dominant source of natural background sediment load, since alluvial channels and mass wasting are not prevalent erosional processes there. The length of stream in a watershed and soil properties can be used to calculate a reasonable estimate of the natural background sediment yield using the soil creep method (Washington DNR, 2011). For the Cedar Creek drainage area, the BLM hydrologist estimated that fine sediment yield from soil creep under existing conditions is approximately 0.2 tons per acre per year and 1,417 tons per year for the 7,000-acre drainage area. The combined sediment yield from existing roads, proposed project road and trail construction, and winter haul, would be 3% of the natural background sediment yield. This increase is far below what is

chronically detectable, which the Washington DNR (2011, pp. B41-B42) noted to occur when sediment is increased by 50 – 100 percent. Therefore, the BLM assumes that if the increase in total yield is more than 100%, the change in annual sediment yield would be large enough to exceed water quality standards.

Based on the above, the BLM concluded that the estimated increases in sediment yield from the Thurston Hills project would not be detectable and would be inconsequential relative to background sediment load. Neither road building and use, nor trail building and use, nor the combination of road/trail building and use would result in detectable changes in water quality. As such, there would be no potential for significant effects from the implementation of the proposed actions, alone or in combination, directly or cumulatively, and that there would be no substantive differences among the alternatives to inform the decision maker. Therefore, this issue was not analyzed in detail.

2.0 Alternatives

This chapter describes the No Action Alternative (Alternative 1) and the action alternatives (Alternatives 2, 3, 4, and 5) for the Thurston Hills project. The BLM considered numerous action alternatives during project development. Several alternatives were considered but eliminated from further consideration, described in Section 2.7.

The action alternatives include a range of trail development and timber harvest actions. For the BLM to consider an action alternative, the alternative must be consistent with the RMP, be feasible, and satisfy the purpose and need established for the project. Because the EA includes two proposed actions – trails and timber harvest – the alternatives provide a range of intensity for both actions, from "do nothing now" to "do as much as possible now". Maps of the action alternatives are included in Appendix A.

Please note that harvest acres and timber volumes provided in the EA are approximations based on the best available planning level data at the time of analysis. As the project progresses and additional field survey information is obtained, acreages and boundaries may differ slightly from those portrayed here. Final acreages at the time of sale tend to be lower, while timber volumes may be lower or higher than estimated during planning.

All of the action alternatives include measures to avoid or minimize adverse environmental effects and ensure conformance with regulations, laws, and policies. Measures include adhering to RMP guidance, utilizing standard design practices, locating project activities in appropriate terrain, and incorporating Project Design Features and Best Management Practices (BMPs). Project Design Features (PDFs) are operating procedures developed by the interdisciplinary team used to avoid or reduce adverse environmental effects and ensure conformance with regulations, laws, and policies. BMPs are specific measures that comply with Oregon Department of Environmental Quality's water quality standards and regulations. The BLM would implement PDFs during design, layout, and construction of the proposed actions, through contract administration and monitoring. Many of the project's key PDFs and BMPs are noted in the following descriptions of the alternatives. A more comprehensive list of PDFs is presented in Appendix B.

2.1 Alternative 1 - No Action Alternative

The No Action Alternative is the only alternative BLM must analyze in detail that does not meet the purpose and need for action. No action provides a baseline to compare environmental effects by describing the existing condition and the continuing trends anticipated in the absence of the action alternatives, but with the implementation of other reasonably foreseeable Federal, State, and private projects. The baseline scenario maintains the ERMA designation, the LUAs, and the RMP management direction on the lands in the study area, and the BLM would propose management actions in the future as needed, consistent with the RMP.

Under the No Action Alternative, the BLM would not implement the development of trails nor a timber harvest plan within the project area at this time. Since the project area consists of lands designated as HLB by the RMP, this alternative (the No Action Alternative) does not preclude future timber harvest. If the no action was selected at this time, it is reasonably foreseeable that the FO would return to the area to implement a timber harvest in the future, as stated in a memorandum from the Upper Willamette Field Office supervisory forester and incorporated

herein by reference (Bickford, 2020). Given that the stands in the project area are in the 70-year age class, it is reasonably foreseeable that the FO would re-initiate planning for a timber harvest project in the Thurston Hills area 10-20 years from now. It is reasonably foreseeable that the proposed harvest area and harvest treatments would be the same or very similar to the current project. The BLM would prepare an EA for such a project at that future time, prior to making any implementation decisions.

2.2 Alternative 2 - Trail Development Only

In this alternative, the BLM would designate and develop non-motorized recreational trails and associated Recreation Management Zones (RMZ) [1] for mountain biking and hiking.[2] Trail designation consists of formally selecting the location of the center line of the trail with GPS and flagging, and creating a digital record of the trails' approximate locations for inclusion in BLM's Transportation System[3], Facility Asset Management System[4], and Ground Transportation Linear Feature[5]. Figures of the proposed trail locations are included in Appendix A.

Alternative 2 would provide approximately 8.5 miles of trail construction with two potential connections to the adjacent WPRD trail system. The trail layout is shown on Figure 1 in Appendix A. Under Alternative 2, trails depicted on Figure 1 in Appendix A would be designated as trails, and a Recreation Management Zone (RMZ), which would span 50 feet from the center line of the trail on both sides of the trail, would be established. 50 feet from center line of trail was selected to be in accordance with the ERMA planning framework.

Trail experiences provided by this alternative are described in detail under Issue 1 in Section 3.0. All of the trail mileage would be open to mountain biking and hiking, with the following directionality:

- 2.8 miles would be bi-directional with bikers yielding to pedestrians
- 1.5 miles would be bi-directional with biking as the primary use and pedestrians yielding to bikers
- 4.2 miles would be one-directional with biking as the primary use and pedestrians yielding to bikers.

Under Alternative 1, the BLM would not implement a timber harvest plan within the project area at this time. Since the project area consists of lands designated as HLB by the RMP, Alternative 1 does not preclude future timber harvest. As with the No Action Alternative, if Alternative 1 was selected at this time, it is reasonably foreseeable that the FO would return to the area to implement a timber harvest in the future. Given that the stands in the project area are in the 70-year age class, it is reasonably foreseeable that the FO would re-initiate planning for a timber harvest project in the Thurston Hills area in the next 10-20 years. It is reasonably foreseeable

[1] A Recreation Management Zone is a subdivision of a Recreation Management Area to further delineate specific recreation opportunities.
[2] The term hiking throughout this EA also implies other pedestrian modes such as trail running and jogging.
[3] BLM's Transportation System represents the sum of the BLM's recognized inventory of linear features (roads, primitive roads, and trails) formally recognized, designated, and approved.
[4] The BLM's national database which tracks asset inventory and maintenance needs.
[5] A linear feature for ground transportation includes roads, primitive roads, primitive routes, trails, temporary routes, and linear disturbances.

that the proposed harvest area and harvest treatments would be the same or very similar to the current project. The BLM would prepare an EA for such a future project at that future time, prior to making any implementation decisions.

2.2.1 Trail Layout

To complement the WPRD trail system, the proposed BLM trail system was designed for predominant use by mountain bikers, with secondary uses by hikers. Trail layout, design, and construction for mountain bike trails have been and would continue to be guided by the International Mountain Bicycling Association (IMBA) trail design guidelines, as expressed in the following documents: *Trail Solutions; IMBA's Guide to Building Sweet Singletrack* (IMBA, 2004), *Managing Mountain Biking: IMBA's Guide to Providing Great Riding* (IMBA, 2007), *Bike Parks*: IMBA's *Guide to New School Trails* (IMBA, 2014); and BLM's *Guidelines to a Quality Trail Experience; Mountain Bike Trail Guidelines* (USDI BLM, 2017).

For the Thurston Hills project, the BLM engaged a professional trail consultant to design and flag the proposed trail corridor on the ground. The consultant flagged the prospective trail corridor using an inclinometer to measure grades and establish sustainable alignments based on accepted current best practices for mountain bike-specific and multi-use natural surface trail development. The flagged corridor is an approximation of where the tread (the riding surface) would be constructed. On-the-ground conditions, such as rocks, roots, and terrain, would dictate the exact location of the trail during final design and construction.

The BLM preliminary trail layout was configured as a stacked loop system that would provide loop opportunities of varying length and experience. The shortest loops, accessed directly from the new trailhead developed by the WPRD, would provide biking/hiking opportunities after work or during lunch breaks, while the longer loops would provide longer "weekend excursions". The system was laid out to maximize the mountain biking experiences of play, challenge, and escape, connected by efficiency segments (please see definitions for these experiences in Table 5 in Section 3.0 under Issue 1).

2.2.2 General Trail Standards for Design, and Construction

The intent, guidelines, and standards for trail development are detailed in this section. The same state-of-the art practices, based on years of experience and improvement, would be applied to all of the trail development alternatives. Many design features that create sustainable low-maintenance trails and prevent environmental degradation would be included during trail development. Many such features are noted below; a more comprehensive list is shown in the table of PDFs in Appendix B.

Design and construction standards utilized mountain biking trail standards in order to provide sustainable non-erodible surfaces that would hold up to biking as well as hiking and trail running. The proposed trail system would be designed to provide a range of difficulty that combines quality scenery, a diversity of natural features, a quality trail experience, and the opportunity for physical exercise. All trail users would be urged (by signage) to stay on the trails. Proper trail design along with the steep terrain would discourage off-trail hiking or mountain biking. The trail would be open year-round and would be expected to be used year-round for non-motorized uses. However, trail use would be discouraged (by signage and monitoring of trail conditions) in abnormally wet conditions.

In identifying management controls such as directional and bi-directional trail segments, or reversing the traditional trail yielding principles for non-motorized trails, the objective is to minimize user conflicts between activity types (biking and hiking), and to help provide a safer experience. Further, traditionally users of non-motorized trail yield the right of way to the person traveling in the uphill direction. For the Thurston Hills directional trails, users would yield to the person traveling in the downhill direction in order to enable continuity of the targeted mountain biking experience.

Design Features

The trail bed would be a single-track, full-bench trail (or partial bench with rock retaining wall, where conditions require). The desired average tread width would be approximately 2-3 feet. Trail widths typical to each experience type are shown on the Trail Development Matrices (Tables 6, 7, and 8) in Section 3.0 under Issue 1.

All trails would contain features such as cambered trail surfaces to drain water and resist user forces, in-sloped turns with varying radii conducive to bicycle use, rolling tread, incorporation of native features (soil, rock), and seamless transitions between trail types. Some of the routes would be designated for directional mountain biking only (primarily on descending routes) to enhance the targeted user experience, and to reduce risk and user conflict. Some technical trail features would be installed on trails requiring greater skills.

The BLM would install signs at trail intersections to communicate trail difficulty, recommended user types, and suggested riding direction for each trail segment. Difficulty rating symbols would conform to guidelines established for the project by the BLM with assistance from the IMBA. If funding and suitable locations are available, BLM would install benches for resting and observing views.

Construction

The trails would be laid out at an average grade between 5-10 percent, depending on the trail type, primary user, and targeted experience. The trail would be generally outsloped to the downhill side or insloped to small drainage basins at approximately 3-5 percent to allow water to shed off the trail. Turns would be constructed with a grade reversal or rolling dip installed both immediately above and below the turns to prevent water from eroding the trail. The trail would be designed to maintain a consistent speed by providing frequent grade reversals, rolling dips, and winding turns, which also serve to shed water off the trail. The BLM would corral the trail with rocks, logs, or constructed materials to prevent users from cutting corners where the trail changes directions on steep slopes. BLM would construct retaining walls and crib walls where necessary to stabilize the trail, particularly on turns and on approaches to drainage crossings.

The BLM would remove stumps from the trail bed and immediately adjacent to the trail bed. Brush and tree branches would be thinned and trimmed back about 3 feet from each side of the trail edge**.** Branches extending over the trail corridor would be cut no higher than 10 feet above the trail surface.

The BLM would construct the trails using hand crews and mechanized trail-building equipment such as mini-excavators, Sweco trail dozers, mini skid steers, and motorized tracked haulers specifically designed for constructing trails. Hand labor would likely be focused on corridor clearing and finish tread work. Construction best practices include cutting the backslope to a sustainable angle of repose, building frequent grade reversals to drain water, sloping the tread to

resist user forces, and clearing the corridor of hazards should a trail user accidentally leave the tread at a high rate of speed. Trail construction would be completed by BLM staff, contractors, and volunteers.

Funding

The BLM would provide funding for trail construction and maintenance at Thurston Hills from a number of different sources, including State and Federal grant programs, BLM Oregon State Office Trails funding, and BLM Northwest Oregon District funding. BLM anticipates being able to fund the entire trail network shown in any of the trail development alternatives over a one to five-year period. This means that trail segments may be constructed in an additive fashion. The first trails would be those connecting to the WPRD trail system (Trails 5, 6, 11), with new trail segments constructed in an eastward progression.

The BLM has consistently received grant funding from the State of Oregon's Recreational Trails Program (RTP). Since 2009, the BLM has averaged approximately $150,000 in annual funding from this program. The BLM anticipates that the Thurston Hills project would be successful in receiving future funding through the RTP grant process.

Partnership Aspects

In October 2019, a Cooperative Management Agreement (CMA-BLM-ORN000-1908) was signed between BLM and WPRD, formalizing collaboration to facilitate planning, design, and management of a comprehensive non-motorized trail system within the BLM's Willamalane ERMA and WPRD's Thurston Hills Natural Area. The agreement also outlines collaborative management strategies for volunteer coordination, uniform signage, and operations and maintenance of trail facilities.

As part of the partnership agreement with WPRD, users of the BLM trails would originate at WPRD's recently constructed trailhead facilities, which include parking, restrooms, signs, and a bike washing station. The signboards at WPRD provides highly visible locations for posted information about trail regulations, user courtesies (best practices), invasive weed precautions, and other notices applicable to the joint trail system. The WPRD has provided a high-quality trailhead with amenities, relieving BLM of the capital expenditures and maintenance costs associated with such a facility.

The BLM has had great success in the past partnering with local recreation organizations on labor for construction and maintenance of trails. In the Eugene area, active mountain biking clubs in the local and regional area, principally the Disciples of Dirt (DOD) Mountain Biking Club, have been very active. The DOD have logged an average of 1,000 hours per year since 2011 for trail construction and maintenance at Carpenter Bypass, a popular BLM-managed Mountain biking trail system approximately 40 miles from the city of Eugene. WPRD has also benefitted from hundreds of hours of volunteer work by the DOD in developing their trail system. BLM's partner-driven recreation strategy acknowledges that with federal funding alone, BLM would not be able to effectively manage its extensive trail networks and needs the help of its local and regional volunteer workforce.

2.3 Alternative 3 - Trail Development and 155-Acre Regeneration Harvest

In this alternative, the BLM would designate and develop non-motorized recreational trails and associated Recreation Management Zones (RMZ) for mountain biking and hiking. Trail designation consists of formally selecting the location of the center line of the trail with GPS and

flagging, and creating a digital record of the trails' approximate locations for inclusion in BLM's Transportation System, Facility Asset Management System, and Ground Transportation Linear Feature. Figures of the proposed trail locations are included in Appendix A.

Alternative 3 includes timber harvest. Features of this alternative relative to trail and harvest interactions include the following:

1) The BLM would develop and designate trails first and establish the RMZ 50 feet from the center line of the designated trail. BLM would then implement the timber harvest activities, followed by trail construction, in order to avoid trail investments that could be damaged by harvesting activities, and to prevent the need for recreational trail closures during the harvest.
2) All trees that are both greater than or equal to 40 inches diameter-at-breast-height (DBH) and that the BLM identified as being established prior to 1850 would be retained. All of the remaining green tree retention (approximately 75 percent) would be left as aggregates (groupings of trees) placed within portions of the RMZ.
3) After the completion of harvest activities, the BLM would construct the trail system, which would incorporate portions of the spur roads constructed for harvest including Spur A, Spur D, and Road 18-2-1.1. The general trail standards and design considerations were described in Section 2.2.2 (under Alternative 2).

2.3.1 Trails

Alternative 3 would provide 8.3 miles of trail. All of the trail mileage would be open to mountain biking and hiking, with the following directionality:

- 2.8 miles would be bi-directional with bikers yielding to pedestrians
- 5.5 miles would be one-directional with biking as the primary use and pedestrians yielding to bikers.

2.3.2 Timber Harvest

The BLM would implement a regeneration harvest on approximately 165 acres utilizing the management direction of the 2016 RMP for timber harvest in the Moderate Intensity Timber Area (MITA). This alternative is shown on Figure 2 in Appendix A. The entire planning harvest unit size is approximately 165 acres, consisting of approximately 155 acres of harvest and 10 acres of aggregate (grouped) green tree retention.

No harvest would occur within Late Successional Reserve or Riparian Reserve land use allocations. The harvest prescription would reduce the final stand density to approximately 10 percent of the pre-harvest basal area. The average volume removal would be 43 thousand board feet (MBF)/acre and the total volume removed would be around 6 million board feet (MMBF). Prior to harvest, project actions would include road construction, road renovation, and culvert installation or replacement. After harvest, additional actions would include site preparation, fuels reduction, and replanting, as described more fully below.

The BLM would incorporate the following harvest practices pursuant to the RMP management direction for regeneration harvest within the HLB and HLB-MITA:

a) Retain 5-15 percent (approximately 10 percent) of the pre-harvest stand basal area in live green trees (RMP, p. 63). Retention of these live trees would include aggregate retention and dispersed retention (scattered individual trees throughout the harvest unit). Dispersed retention would target retaining the largest and most vigorous trees.

b) Include among the retained live trees any tree greater than 40 inches diameter-at-breast-height (DBH) and that BLM identified as being established prior to 1850, except when falling for safety or operational reasons. Any felled trees of this type would be retained on site (RMP, p. 63).

c) Within the aggregates, all trees would be retained unless trees need to be cut for safety reasons or to allow for yarding corridors and skid trails.

d) Retain an additional 1 tree per acre (TPA) for snag creation. Snag creation would be implemented within 1 year of yarding the timber sale (RMP, p. 61).

e) Snags would not be created within falling distance of power lines, structures, roads, or trails that will remain open after harvest activities. If it is not possible to create enough snags outside the falling distance (calculated as 1.5 times tree height for this project), trees equivalent to the required number of snags would be cut and retained as down woody material in the harvest unit (RMP, p. 61).

f) Retain snags that existed prior to the August 15, 2018 Decision Record > 20" (inches) DBH and snags 6-20" in decay classes III, IV, and V, except for safety, operational or fuels reduction reasons (RMP, p. 60). Retain snags that existed at the time of sale ≥ 6" DBH cut for safety or operational reasons as down woody material, unless they would also pose a safety hazard as down woody material.

g) Retain down woody material that existed prior to the August 15, 2018 Decision Record > 20" in diameter at the large end and > 20 feet in length, and existing down woody material 6-20" in diameter at the large end and > 20 feet in length in decay classes III, IV, and V except for safety, operational or fuels reduction reasons.

Harvest Methods

Two different harvest methods - ground-based and cable (skyline) yarding - are anticipated by the harvest plan. The BLM would allow either ground-based or cable yarding methods on slopes with an incline less than 35 percent, except in one area of hydric soils in Section 1 too fragile for ground-based equipment, where the required method would be cable only (shown on the map in Figure 2 in Appendix A). The BLM would require cable yarding on slopes ≥ 35 percent. On slopes ≥ 50 percent, only hand-felled cable would be allowed.

The BLM has analyzed the project area to account for these harvest methods. Table 2 presents the estimated acreage of each slope class within the Alternative 3 harvest area and the harvest methods allowed within each. The anticipated harvest methods do not include helicopter yarding because the harvest area would be easily accessible by roads, from which cable yarding and ground-based equipment could be used.

Whole-tree yarding or yarding with tree tops attached[6] would be required to minimize slash (residual fuels) within the units. This would be a Project Design Feature (PDF) stipulated in the contract.

Table 2. Acres of Logging Systems Analyzed Based on Slope, Alternatives 3 and 5

Logging System	Percent Slope	Acres**
Ground-based or Cable*	0-35	140
Hand or Machine Felled Cable	35-50	12
Hand Felled Cable	50+	13
*Ground-based or cable-yarded with hand or machine cutting ** Acres include 10 acres of aggregate retention which would not be harvested		

Road Construction, Renovation, Improvement, and Maintenance

Appendix C contains the table of proposed roadwork associated with this Pedal Power Timber Sale alternative, and Figure 2 in Appendix A shows the proposed roadwork for this alternative. The roadwork would involve the construction of approximately 0.4 mile of new roads and 4 miles of renovation of existing roads. It would also include installation and replacement of cross-drains at frequent intervals along roads and new or replacement culverts at stream crossings. Up to four (4) culverts for stream crossings would be replaced on existing roads and up to one (1) new culvert for a stream crossing would be installed on new roads. No fish-bearing streams were identified in the project area, but all culverts at stream crossings would be designed to pass runoff from a 100-year flood event, per RMP direction (RMP, p. 79). Road No. 18-2-1.1 would be gated at its junction with Road No. 18-2-1, to separate the proposed trail along this spur from vehicular uses. A gate would also be placed on Road No. 18-2-1 where it enters Section 31.

The harvest would require equipment and log-haul access to the harvest units via 79th Street and Road No. 18-2-1, the BLM road continuing from 79th Street into Section 1. During equipment staging, log loading, and road/culvert work, Road No. 18-2-1 could be blocked for short periods while the necessary operation is accomplished. In order to minimize impacts to residences with driveways off of Road No. 18-2-1, the BLM would implement the following stipulations:

- Provide warning signs and flaggers to control traffic on Road No. 18-2-1 in Section 1 during active timber falling and yarding operations within the distance specified by

[6] Whole-tree yarding, or yarding with tops attached, is a harvest method where the entire tree (trunk, limbs, and top) is removed from the harvest area. This method is employed to reduce the amount of residual slash in the units by bringing that slash to the landing, where it would be disposed of via piling and burning, chipping, or hauled off-site for processing.

the Occupational Safety and Health Administration (OSHA). The road shall not be blocked by such operations for more than 20 minutes.

- Keep Road No. 18-2-1 open from 5:00 pm to 7:00 am during culvert replacements to allow access to homes and coordinate closures with homeowners prior to culvert replacement.

Post-harvest, approximately 0.8 mile of Road No. 18-2-1 in Section 31 would be partially decommissioned by placing waterbars. Spur A (and the connecting Spurs E and E1) would remain in place and blocked at its junction with Road No. 18-2-1, to separate the future proposed trail along portions of this spur from vehicular uses. Spur C would be left in place and blocked. Spur D and the portion of Road No. 18-2-1 in Section 31 would be blocked and water-barred. The portion of Road No. 18-2-1 in Section 1 would remain open for vehicular use.

Post-Harvest Slash Disposal, Site Preparation, and Reforestation

The BLM would conduct post-harvest slash disposal as necessary for fire hazard reduction and site preparation (to reduce residual harvest slash levels and to allow planting in the regeneration harvest units). Residual activity fuel slash within the timber sale units would be minimized via whole tree yarding. Slash reduction and disposal activities on the entire project area may include piling (machine or hand), lop and scatter, slashing, mastication, biomass removal, burning, or any combination of techniques that would sufficiently reduce the residual slash and vegetation. The BLM fuels specialist, in consultation with other specialists, would conduct a fuels assessment for each harvest area and identify locations requiring additional slash disposal. The majority of slash disposal treatments would begin within 90 days after completion of harvest activities. Pile burning would occur in the first wet season possible; however, it could take one to two years to complete, due to seasonal air quality concerns and weather conditions that impose restrictions on burning.

After site preparation and slash disposal, the BLM would reforest to a stand-level average of at least 150 trees per acre within 5 years (ROD/RMP, pp. 62-63), consisting of predominantly Douglas fir mixed with western hemlock and western red cedar. BLM may need to slash competing shrubs, vines, and invasive species during the replanting period to allow safe and efficient access for hand planting and/or to facilitate seedling growth. The Upper Willamette FO does not currently apply herbicides or pesticides on BLM-administered lands, but may apply herbicides in the project area in the future if BLM's use of herbicides in the Upper Willamette Field Office becomes authorized.

2.4 Preferred Alternative 4 - Trail Development and 109-Acre Regeneration Harvest

In this alternative, the BLM would designate and develop non-motorized recreational trails and associated Recreation Management Zones (RMZ) for mountain biking and hiking. Trail designation consists of formally selecting the location of the center line of the trail with GPS and flagging, and creating a digital record of the trails' approximate locations for inclusion in BLM's Transportation System, Facility Asset Management System, and Ground Transportation Linear Feature. Figures of the proposed trail locations are included in Appendix A.

Similar to Alternatives 2 and 3, trails would create mountain biking and hiking opportunities, allowing visitors to enjoy physical exercise, leading to improved physical fitness and health maintenance. These, and other outcome objectives, would be protected by the RMZ, which

would allow the trail to be realigned should resource concerns be encountered during trail construction or maintenance.

Alternative 4 includes timber harvest, but would forego harvest on approximately 56 acres of HLB in the eastern portion of Section 1, and green tree retention would be increased to 15% of pre-harvest basal area. Features of this alternative relative to trail and harvest interactions include the following:

1) The BLM would develop and designate trails first and establish the RMZ 50 feet from the center line of the designated trail. Within and adjacent to harvest areas, BLM would then implement the timber harvest activities, followed by trail construction, in order to avoid trail investments that could be damaged by harvesting activities, and to prevent the need for recreational trail closures during the harvest. BLM could begin trail construction in the 56 acres deferred from harvest at any time.
2) All trees that are both greater than or equal to 40 inches diameter-at-breast-height (DBH) and that the BLM identified as being established prior to 1850 would be retained. All of the remaining green tree retention (approximately 75 percent) would be left as aggregates (groupings of trees) placed within portions of the RMZ.
3) After the completion of harvest activities, the BLM would construct the trail system throughout the timber harvest areas, which would incorporate portions of the spur roads constructed for harvest including Spur A. The general trail standards and design considerations were described in Section 2.2.2 (under Alternative 2).

2.4.1 Trails

Alternative 4 would provide 8.5 miles of trail development. All of the trail mileage would be open to mountain biking and hiking, with the following directionality:

- 2.8 miles would be bi-directional with bikers yielding to pedestrians
- 1.5 miles would be bi-directional with biking as the primary use and pedestrians yielding to bikers
- 4.2 miles would be one-directional with biking as the primary use and pedestrians yielding to bikers.

2.4.2 Timber Harvest

The BLM would implement a regeneration harvest on approximately 109 acres per the management direction of the 2016 RMP for timber harvest in the MITA (see Figure 3 in Appendix A). The entire planning harvest unit size would be approximately 109 acres, consisting of approximately 98 acres of harvest and 11 acres of aggregate (grouped) green tree retention. Similar to Alternative 3, no harvest would occur in Late-Successional Reserve or Riparian Reserve. Within the HLB, the harvest prescription would reduce the final stand density to approximately 15 percent of the pre-harvest basal area. The average volume removal would be 40 thousand board feet (MBF) / acre and the total volume removed would be around 4.0 million board feet (MMBF). This alternative would implement the same harvest practices (a through g) listed under Alternative 3 for regeneration harvest within the HLB and HLB-MITA (see Section 2.3.2), except target retention level would be increased to 15%.

Harvest methods would be the same as for Alternative 3, and whole-tree yarding or yarding with tree tops attached would be required. The BLM has analyzed the project area to account for these harvest methods. Table 3 presents the estimated acreage of each slope class within the Alternative 4 harvest area and the harvest methods allowed within each.

The Pedal Power Timber Sale was sold and awarded in Fall 2018 under the May 2018 Thurston Hills EA and August 2018 DNA. Road construction, renovation, culvert installation/replacement, and gate installation were completed in spring 2019, prior to the September 18, 2019 ruling in *Cascadia Wildlands and Oregon Wild*. These activities were conducted identically to how they are described under Alternative 4 of the May 2018 EA. These activities were also the same as Alternative 3 of this EA except road renovation is reduced to 3.5 miles from 4.0 miles because Spur D was not built.

Post-harvest fuels reduction, site preparation, and reforestation activities would be the same as described for Alternative 3.

Table 3. Acres of Logging Systems Allowed and Analyzed Based on Slope Class, Alternative 4

Logging System	Percent Slope	Acres**
Ground-based or Cable*	0-35	85
Hand or Machine Felled Cable	35-50	11
Hand Felled Cable	50+	13
*Ground-based or cable-yarded with hand or machine cutting **Acres include 11 acres of aggregate retention which would not be harvested		

At a future time, the 56 acres of HLB where harvest was forgone and trails developed would be harvested, as intended by the RMP. This is a feasible option because BLM anticipates combining these 56 acres with a larger future harvest in Section 5 to plan an economically viable timber sale. At that time, a harvest plan and EA would be prepared.

2.5 Alternative 5 – 165-Acre Regeneration Harvest Only

This alternative would implement a regeneration harvest of 165 acres but would not develop trails. BLM would address any future trail designation and development in a future EA. This alternative is illustrated on Figure 4 in Appendix A.

The harvest design, silvicultural prescription, harvest methods, road work (Appendix C), post-harvest activities, and anticipated timber volume would be the same as for Alternative 3, except gates would not be installed (see Section 2.3). Green tree retention would be at 5 to 15% of pre-harvest basal area and include a combination of aggregate and dispersed trees, to be designed at implementation.

2.6 Comparison of Action Alternatives

Table 4. Comparison of alternatives with approximate trail miles, harvest acres, timber volumes, and road miles

ACTION	Alternative 1	Alternative 2	Alternative 3	Preferred Alternative 4	Alternative 5
TRAILS	No	Yes	Yes	Yes	No
Trail Miles by Use					
Total (Hiking/Biking)		8.5	8.3	8.5	
Mountain Biking Trail Miles By Primary Experience Type					
Escape / Intermediate		1.5	1.5	1.5	
Challenge / Advanced		2.2	2.5	2.2	
Play / Intermediate		3.4	2.8	3.4	
Efficiency / Intermediate		1.4	1.5	1.4	
REGENERATION HARVEST	No	No	Yes	Yes	Yes
Acres (Approximate)					
Total Harvest Unit Size			165	109	165
Regeneration Harvest			155	98	155
Aggregate Green Tree Retention			10	11	10
Timber Volume (Approximate MMBF)					
Timber Volume			6	4	6
Road Work Associated with Timber Harvest					
Total Miles			4.4	3.9	4.4
Miles of Construction			0.4	0.4	0.4
Miles of Renovation			4	3.5	4

2.7 Alternatives Considered but Eliminated from Detailed Analysis

The BLM is required to include a discussion of all reasonable alternatives to the proposed action. Reasonable alternatives are those which are technically and economically feasible, and which

meet the purpose and need for the project. The BLM may eliminate from detailed analysis any alternatives that meet any of the following conditions:

- it does not meet the purpose and need;
- it is technically or economically infeasible;
- it is inconsistent with the basic policy objectives for the management of the area;
- its implementation is remote or speculative;
- it is substantially similar to an alternative being analyzed in detail; or
- it would have substantially similar effects to an alternative being considered in detail.

Alternatives considered for the Thurston Hills project but eliminated from detailed analysis are described below.

Allow Horses on the Proposed Trail System

The BLM received comments regarding particular trail uses commenters wanted to see, including some requesting the BLM to plan for and allow horses on the non-motorized trail system in the ERMA. The commenters did not describe what this alternative would consist of specifically. The BLM interprets this to mean allowing horses on the same trails as hikers and bikers or constructing trails solely for equestrian use.

The Willamalane ERMA framework documents the land use planning decisions for the ERMA made as part of the decisions in the Record of Decision for the Northwestern and Coastal Oregon ROD/RMP. One of the land use planning decisions are the designated recreation opportunities that the BLM would manage the ERMA to provide. In the Willamalane ERMA framework, it specifies that developed trails will be for walking, hiking, and mountain biking, and that trails would be closed to equestrians. As such, an alternative under which the BLM would build or manage trails for equestrian use in this ERMA, whether multi-use or exclusive use, would be inconsistent with the basic policy objectives for the management of the area, so this alternative was not considered in detail.

Provide Alternate Public Access Points from Springfield

Two individuals suggested connecting the trail system to existing or former roads in Springfield, so that trail access would extend closer to the urban area. Incorporating both suggestions, this alternative would create a trail connection to the ERMA through private property from 66th Street in Springfield and a trail connection from the former Weyerhaeuser haul road (noted as running generally from Springfield to Jasper) through WPRD lands.

The BLM has no jurisdiction over the use or disposition of these roads. In the case of 66th Street, obtaining easements for public access through private property for the purposes of trail development is speculative and beyond the scope of this project. Relative to the former Weyerhaueser haul road, the WPRD already owns a portion of this road and it has already been incorporated into the WPRD's Thurston Hills Natural Area plan. This section is from 58th Street to the southern limit of the WPRD property. The road is behind a locked gate but is open to public non-vehicular access. As such, that portion of the haul road will become an access point for the proposed BLM trails from the south side of the WPRD trail system after it is constructed. This is therefore substantially similar to the trail alternatives analyzed in detail, which assumes connection to the WPRD trail system. Ownership of the former haul road south of the WPRD property,

heading to Wallace Creek, was transferred to the City of Springfield for conversion into a local street and is thus committed to other planned uses. Public access from the portion of the haul road south of the WPRD property is therefore not feasible. For all the reasons noted, this alternative was eliminated from detailed analysis.

Develop a thinning-only alternative.

A scoping comment asked for no regeneration of older stands. While not specifying the age of "older stands", the comment indicates that the commenter is seeking an alternative with a thinning prescription rather than a regeneration prescription. This alternative would thus apply a thinning prescription to the 69-year-old stands in the project area. The alternative for thinning was considered but not analyzed in detail because it does not meet the purpose and need for timber harvest of adjusting the age class distribution (Section 1.1.2). The current Eugene SYU and Upper Willamette harvest land base is lacking in 0-10 year age classes that are required for a sustainable timber resource (see Issue 4 in Section 3.0, and Figure 2 on page 9 of this EA). Thinning would not allow the BLM the opportunity to shift acres from the over-represented 70-year age class to the under-represented 0-10 year age class and therefore would not meet the purpose and need.

Develop an alternative that would respond to a purpose and need of storing carbon in forest ecosystems.

A public scoping comment requested that the BLM develop an alternative with a purpose and need to maintain and increase carbon storage in forest ecosystems, by: a) deferring harvest of older forests; and b) thinning younger stands. Carbon storage is not a management objective or management direction for the HLB and cannot therefore be a purpose for managing timber in the HLB. As such, implementing any forest management actions for carbon storage would be inconsistent with the basic policy objectives for the management of the area, and this alternative was eliminated from further consideration.

Conduct timber harvest in Eucephalus vialis (wayside aster) sites.

Wayside aster is a BLM Sensitive Species found at five sites in the Thurston Hill project area, all of which occur in or partly overlap the HLB. Wayside aster is subject to an Interagency Conservation Agreement (ICA) among the BLM, U.S. Forest Service, and the U.S. Fish and Wildlife Service (USDI Bureau of Land Management, USDI Fish and Wildlife Service, and USDA Forest Service, 2006). The RMP Management Direction for Bureau sensitive species subject to a conservation agreement is to manage the species "*consistent with any conservation agreements or strategies including the protection and restoration of habitat, alteration of the type, timing, and intensity of actions, and other strategies designed to conserve populations of the species*" (RMP pg. 87). The BLM evaluated timber harvest alternatives (thinning and regeneration harvest) at the aster sites to assess their effectiveness at meeting the ICA.

Three of the wayside aster sites in the vicinity of 79th Street, on approximately 26 acres, are part of a habitat management (thinning harvest) experiment conducted in 2006 under the auspices of the ICA. The purpose of the experiment is to compare the effects of different canopy treatments on aster populations and observe changes over time. The BLM determined that timber harvest in these sites at this time would not allow BLM to "*continue interagency studies…on how…the species responds to canopy changes*" and that continued monitoring and sharing data about the

site would be necessary to meet the management intent of the ICA (Newton, Stanley, Thorpe, and Kaye, 2010).

The BLM discovered two additional wayside aster sites on approximately 3 acres during surveys in 2017 and designated them "Upper 79th Street Roadside" and EUVI8-JB1. The BLM evaluated an alternative that would conduct commercial thinning in these sites and an alternative that would conduct regeneration harvest in these sites. The BLM developed a thinning treatment prescription for these sites that would maintain canopy cover from 30 to 50 percent, based on guidance in the ICA, the *Conservation Assessment for Eucephaus vialis [Bradshaw] Blake* (Vance and Larson, 2005), and study findings from the BLM-sponsored wayside aster habitat experiment (Newton, Stanley, Thorpe, and Kaye, 2010). This treatment would be localized within aster sites (considered as the location of the plants plus a 100-foot buffer around the plants) and would reduce the existing approximately 69 percent canopy cover to 30-50 percent cover. Such a treatment was estimated to maintain suitable canopy conditions for the plants while leaving enough cover (shade) to lower the risk of an invasive weed infestation. The BLM evaluated thinning and found that:

a) Due to the small size of these aster sites, located within the HLB where regeneration harvest was proposed, the trees in the thinned aster patches would be islands surrounded by regeneration harvest and would have a high risk of blowdown, particularly the larger patch (approximately 2 acres) which is located on a hilltop. Wind-thrown trees would damage aster plants, reduce canopy levels (below the target), and disrupt soils in close proximity to the plants where noxious weeds would have a high probability of moving in.

b) The thinning harvest operation would create yarding corridors (soil disturbance) through the patches, which would be highly prone for invasion by noxious weeds due to the high prevalence of invasive plants in the project area (see discussion of invasive plants in *Issues Considered*, in Section 1.6 of the EA). Studies have found that invasive weeds moving into aster sites outcompete the aster and reduce populations (Newton, Stanley, Thorpe, and Kaye, 2010).

The BLM determined that such conditions associated with a thinning alternative would not meet the stated management action in the ICA "to *implement habitat enhancement*" (ICA, p. 7) and would therefore not be consistent with RMP Management Direction. BLM botanists also evaluated a regeneration harvest in these sites and determined that the approximately 10 percent resulting canopy cover from a regeneration harvest would not maintain favorable conditions for perpetuation of wayside aster populations and surficial soil disturbance would increase the risk of invasive weeds that would outcompete the wayside aster. Regeneration harvest would therefore not meet the stated management action "to *implement habitat enhancement*" (ICA, p. 7) and would not be consistent with the RMP Management Direction.

Based on these evaluations, the BLM eliminated harvest treatments in aster sites at this time from detailed analysis because they would not meet the basic policy objectives for the management of the area. These areas were deferred from harvest at this time.

3.0 Affected Environment and Environmental Consequences

This section presents the analyses of issues considered in detail, identified in Chapter 2. For each issue, the analyses include descriptions of the existing conditions (Affected Environment) and

the potential changes to those conditions (Environmental Effects) as a result of implementing the project alternatives. These sections provide the scientific and analytical basis for comparing alternatives.

Issue 1: How would the trail development plan provide for different recreational experiences and levels of difficulty for mountain biking and hiking?

Affected Environment

The BLM's proposed mountain biking trail system would follow BLM's 2017 *Guidelines for a Quality Trail Experience* (U.S.D.I. BLM, 2017), which focus on the design and construction of mountain biking trails. The BLM does not have a similar handbook for hiking trails. Therefore, this issue focuses on characterizing the mountain biking experience, with the expectation that many of the same considerations apply to the hiking experience. See Table 5 for the definitions of terms from these guidelines used throughout this section.

Working with the existing landscape and terrain features is key to designing a high-quality recreational experience for mountain biking. The terrain in the Thurston Hills project area varies from relatively flat to undulating to steeply sloped, with elevations ranging from 820 to 1,575 feet above sea level. The site is dissected by many riparian corridors, with most streams running from southeast to northwest. Section 1 has a well-used road (extension of 79th Street), houses/driveways to the north, and a high-voltage powerline corridor running north-south through its eastern portion. The connection to the WPRD trails would occur on the west side of Section 1. Section 31 is more remote with no existing or proposed vehicle use on Road 18-2-1, but residences occur along the BLM boundary on the southeastern edge. These features are shown on the figures in Appendix A.

The goals for the mountain biking experience would be diverse experiences, varying levels of difficulty, and consistency with the design/construction standards of the WPRD system. Given the location of the project area in close proximity to residences and the developing/urbanizing core of Springfield, Play was targeted as the primary experience. Even in settings with traffic noise or visual obtrusions such as powerline corridors, the level of play can be increased to distract riders from these conditions. Play is highly prized by mountain bikers, and bikers are able to take advantage of it more than other non-motorized users because of a biker's ability to release stored kinetic energy. The Play experience in the Thurston Hills trail layout was maximized by placing trails in a variety of forest conditions where the trail could weave through the trees. Play would also be provided by taking advantage of the natural undulations in the terrain to create grade changes, which provide opportunities for mountain bikers to gain momentum to maximize the use of play-based features such as rollers and berms.

The undulating and steep portions of the ERMA provide good opportunities for the Challenge experience. Challenge requires more effort and expertise than the other trail experiences, and provides a good complement to Play. The challenging trails would not be overly obtrusive with man-made features but would utilize steeper grades, tighter corridors, gravity dips, and the occasional boulder that occurred naturally or would be easily moved into the trail.

The Escape experience was only possible where the trail would have a remote feeling, at a distance from visual reminders of urban development. The Escape experience in the project area is limited to the farthest reaches of the trail system in Section 31, where the distance to reach it from the WPRD trailhead (approximately 4-5 miles) would convey remoteness and the

surrounding forests reserved from harvest (Riparian Reserves) would provide a mature canopy with good ability for visual and auditory screening from surrounding development.

Table 5. Definitions of Terms from 2017 BLM Guidelines for a Quality Trail Experience	
Play Experience	Engaging in the activity purely for the enjoyment, bringing a childlike wonder to the pursuit, no destination. On a trail, this often means seeking features to enhance, alter the experience, rather than simply riding from point to point. Playfulness is a hugely important characteristic in mountain bike trails, and distinguishes trail experiences from many other trail user goals (hikers, nature seekers).
Challenge Experience	Seeking to improve technical abilities, to solve a difficult problem, "clean" a trail feature or segment; sense of accomplishment.
Escape Experience	Something that takes you away from your daily grind, allows you to get lost in the experience of riding. Often means getting away from the urban environment.
Efficiency	Getting to a destination with the least amount of time or energy expended. Efficiency trails are used to access landscapes or trails where more desirable experiences can be found. In the case of this project, the efficiency trails are used to reach play and challenge trails and are typically relatively straight up or down hills.
Difficulty	The level of physical exertion or skill required. The targeted difficulty level influences how the trail is designed, including factors such as width, grade, trail texture, and corridor width.
Management Controls	The rules and instructions applied to the trail, such as directionality, allowed uses, and yield rules. Management controls influence the trail experience. For example, providing technical challenge for descending cyclists is most safely achieved when all other users yield to them.
Route Designation	The user types for which the trail segment is open and managed.
Trail Width	Typically, the active tread width available for travel. The constructed tread width is frequently 10-30% greater than the active tread width, to allow users to "find the good line" on the trail.
Technical Trail Features	Objects or conditions, either natural or manmade, that provide additional challenge on the trail. A rock garden would be an example of a natural technical trail feature, whereas a jump would be a manmade one. These features may be incorporated into the trail as mandatory (must pass over) or avoidable, according to the targeted skill level. The difficulty rating of a technical trail feature is frequently noted separately from other trail conditions contributing to difficulty level, such as grades or trail textures.

Segments connecting the above-targeted experiences would be Efficiency segments. The Efficiency segments were located to provide connections between the other experiences, allowing straightforward access to those more desirable experiences.

The BLM trail consultant assessed the eastern portion of Section 1 to have the most valuable terrain for mountain biking experiences, providing a good mix of play and challenge at the intermediate and advanced skill levels. The trails located here would supply the greatest potential for vertical drop in the project area. This area is also particularly conducive for trails because of

its (existing) mature conifer forest, moderate side-slopes, varying terrain, absence of wet spots, and absence of residential structures along the eastern and southern section boundary.

Environmental Effects

Alternative 1 – No Action

Direct and Indirect Effects

The No Action Alternative would not implement trail development, and therefore would not provide new recreational opportunities to meet the unmet demand for hiking and mountain biking in the greater Eugene area. The No Action Alternative would therefore not address the recreational needs identified by the RMP, would not satisfy BLM's partnership with the WPRD, and would not meet the purpose and need for trail development in the ERMA.

Alternative 2 – Trails Only

Direct and Indirect Effects

This alternative would develop approximately 8.5 miles of new designated non-motorized, single-track trails within the ERMA (Figure 1 in Appendix A). The 8.5 miles of trail represent a broad range of trail experiences (play, escape, challenge, and efficiency), as detailed on Table 6, the Trail Development Matrix for Alternative 2. This alternative provides intermediate and advanced opportunities, with a variety of technical trail features including jumps, berms, grade reversals, and rollers on 11 distinct segments of trail. Trail widths would be narrow (24-36 inches) across all trail segments, providing for a challenging and fun experience. Trail designation would create mountain biking and hiking opportunities, allowing visitors to enjoy physical exercise, leading to improved physical fitness and health maintenance. These and other outcome objectives listed in the ERMA framework would be protected by the RMZ, which would allow the trail to be realigned within the RMZ should resource concerns be encountered during trail construction or maintenance.

The quality of trail tread for mountain biking would be high in this alternative because the entire trail system would be located in mature predominantly evergreen forest. Under such a forest canopy, a thin organic layer builds up on the tread. Such a layer protects the trail from the elements and promotes a highly desired riding surface: the unrivaled "drift" for which Pacific Northwest mountain bike trails are known.

The direct effects of this alternative compared to the No Action would be an approximately 8.5-mile increase in the length and diversity of trail opportunities available within easy commuting distances of Springfield and Eugene, for hikers and bikers. Trail users who might be tired of biking or hiking the same trails 'over and over again' within 30 and 60 minutes of their residence would have new and varied opportunities.

Cumulative Effects

Reasonably foreseeable similar actions within the analysis area within the next 10-15 years include hiking and mountain biking trail development by WPRD on the adjacent 176-acre Thurston Hills Natural Area. WPRD assumes approximately 12 miles of trail for their planning area adjacent to BLM land, and has already constructed approximately 6 miles to date.

The BLM trail system would enhance WPRD's trail system by extending the length of trail mileage and by complementing the landscapes, trail types, and experiences that would be available within the combined network. Complementary seasonal uses would also be a result of

the combined system. The majority of the WPRD's Thurston Hills Natural Area faces south-southwest in oak savannah landscape, ideal for fall-through-spring use, but less so in the hot and dry summer. Conversely, the ERMA is primarily north-facing and forested with conifers, which makes for excellent trail conditions from late spring through fall.

The approximately 20 miles of the combined trail system would provide a much-needed recreational opportunity in the Eugene/Springfield area. The proposed Thurston Hills Trail system would be accessible from anywhere in the Eugene/Springfield area within approximately 5-20 minutes. This combined trail system would offer a broad range of high-quality mountain biking and hiking experiences into the future.

As described under the description of Alternative 2 in section 2.2, it is reasonably foreseeable that the FO would reinitiate a timber harvest project in the Thurston Hills area in the next 10-20 years. Should a timber harvest alternative be chosen from that planning effort, it is reasonably expected that effects to the trail system would be similar to Alternatives 3 and 4 in this EA.

Alternative 3 – Trail Development and 165-Acre Regeneration Harvest

Direct and Indirect Effects

The total miles of new designated trail for this alternative would be approximately 8.3. Alternative 3 (Figure 2 in Appendix A) would be designed to account for the conditions that would be present after a proposed regeneration harvest on 165 acres of HLB within the ERMA, since trail construction would occur after timber harvest. The anticipated trail mileage, experiences, and levels of difficulty are shown in Table 7, the Trail Development Matrix for Alternative 3. Trail designation would create mountain biking and hiking opportunities, allowing visitors to enjoy physical exercise, leading to improved physical fitness and health maintenance. These and other outcome objectives would be protected by the RMZ, which would allow the trail to be realigned within the RMZ should resource concerns be encountered during trail construction or maintenance.

Timber harvest has no impact on realizing recreation objectives. The recreation values of open space and non-motorized trail opportunities would still be created and the objective of providing mountain biking and hiking opportunities would still be met. This alternative retains green trees inside the RMZ because trail users have a variety of preferences for trail settings. The green tree retention, combined with unharvested riparian areas, would allow the trail to flow through both shaded and exposed areas, with approximately 40% of the trail in shaded areas and 60% in open areas, providing for a range of recreational experiences and difficulties.

Where the trail winds through Riparian Reserve (Trails 1, 2, and most of 11), trail experiences and trail tread quality would be similar to Alternative 2 because canopy and soil conditions would be unaltered by harvest. Trails outside of the Riparian Reserve would be in the regeneration unit. The layout and construction of these would need to be modified in response to the anticipated post-harvest conditions, including loss of mature tree canopy, open trail exposure, and the presence of new roads constructed for use during harvest.

The loss of tree canopy associated with the timber harvest would result in a loss of natural variation in vegetation type and terrain, and loss of the natural "drift" feeling of the trail tread derived from the organic layer of soil found below dense canopies. The mountain biking experience would not have the highest quality tread, particularly for the Play experience. Because the organic layer would not exist, other ways to enhance the trail tread and make the

trails challenging and playful would be employed. More soil would need to be manipulated to increase the sinuosity and amplitude of the tread to enhance the playful feel of the trails (for Play). More man-made Technical Trail Features (rollers, jumps, rock gardens) would need to occur with greater frequency, and trail grades would need to be steeper to provide the desired experience of challenge.

The trail segments in the regeneration harvest areas would be subject to increased direct rainfall, wind erosion, freeze-thaw, and seasonal over-drying. These conditions reduce the ability of the trail system to withstand heavy use during the preferred spring-to-fall season. To counter these effects, additional construction efforts would be implemented to amend the soil with crushed rock and to manipulate the trail tread to accommodate more variable drainage conditions. These actions would help provide a sustainable trail tread for hikers and bikers, even in exposed areas.

To accommodate for post-harvest conditions, the trail layout and experience was modified from Alternative 2 in the following ways:

- Spur D (renovated for harvesting access) would be used as the route for Trail #4 rather than the sinuous route through forest of Alternative 2 and Trail #4 would be designed for challenge rather than play.
- Spur A (constructed for harvesting access) or portions thereof would be used for the trail segment of Trail #5 connecting to the WPRD property.
- On both spurs, the roadbed material would be reworked to create the desired experience and additional large rock imported to enhance the technical challenge of these trail segments. Larger mechanized equipment may need to be utilized to effectively move the necessary material.
- To compensate for the loss of trail mileage from the revised Trail #4, a new trail (#12) was added, for a total of 12 trail segments. This trail (0.25 mile loop) would be routed into Riparian Reserves to take advantage of the mature canopy cover there.

To reduce the loss of canopy along trail corridors, Alternative 3 would include approximately 7 acres of aggregate green tree retention along the trails within portions of the RMZ. Their approximate locations are shown on Figure 2 in Appendix A. These forested corridors would preserve some of the characteristics that provide high quality tread and enhance the play and challenge experiences. Portions of trail segments #2, #5, and #6 would benefit from this retention.

Cumulative Effects

The cumulative effects of implementing Alternative 3 trail system would be similar to the analysis described under Alternative 2. The trail system would be 0.2 miles less under this alternative and the specific trail experiences and features would be created differently. However, the trail mileage, types of experiences, and levels of difficulty would be essentially the same and combined with the WPRD system would convey the same beneficial recreational opportunity into the future.

Preferred Alternative 4 – Trail Development and 109-Acre Regeneration Harvest

Direct and Indirect Effects

This alternative provides a combination of trail layouts from Alternatives 2 and 3 (see Figure 3 in Appendix A), for a total designated trail mileage of approximately 8.5 miles. This alternative would implement the trail layout and experiences of Alternative 2 in the 56 acres on the east side of Section 1 that would be deferred from harvest at this time, and the trail layout and experiences of Alternative 3 on the rest of the project area. See the mileage, targeted experiences, and levels of difficulty for this alternative on Table 8, the Trail Development Matrix for Alternative 4. Trail designation would create mountain biking and hiking opportunities, allowing visitors to enjoy physical exercise, leading to improved physical fitness and health maintenance. These and other outcome objectives would be protected by the RMZ, which would allow the trail to be realigned within the RMZ should resource concerns be encountered during trail construction or maintenance.

Timber harvest has no impact on realizing recreation objectives. The recreation values of open space and non-motorized trail opportunities would still be created and the objective of providing mountain biking and hiking opportunities would still be met. This alternative retains green trees inside the RMZ because trail users have a variety of preferences for trail settings. The green tree retention, combined with unharvested riparian areas, would allow the trail to flow through both shaded and exposed areas, with approximately 60% of the trail in shaded areas and 40% in open areas, providing for a range of recreational experiences and difficulties.

Similar to Alternative 3, this alternative would include aggregate green tree retention within portions of the RMZ but would increase the overall retention level to 15% of pre-harvest stand basal area, the maximum allowed on HLB-MITA lands. This alternative would include approximately 11 acres of aggregate green tree retention along the trails, located in similar locations as Alternative 3, as shown in Figure 3 in Appendix A. These forested corridors would preserve some of the characteristics that provide high quality tread and enhance the play and challenge experiences.

Cumulative Effects

The cumulative effects of implementing Alternative 4 trail system would be similar to the analysis described under Alternative 2. The addition of BLM-managed trails combined with the WPRD trail system would address the need for broad range of mountain biking and hiking experiences in the Eugene/Springfield area into the future.

Alternative 5 – 165-Acre Regeneration Harvest Only

Under Alternative 5, BLM would not develop trails. Similar to the No Action Alternative, this alternative would not provide new recreational opportunities to meet the unmet demand for hiking and mountain biking in the greater Eugene area. This alternative would therefore not address the recreational needs identified by the RMP, would not satisfy BLM's partnership with the WPRD, and would not meet the purpose and need for trail development in the ERMA.

Issue 2: What are the costs and revenues associated with trail building, road construction, and timber harvest?

Affected Environment

For this issue, BLM has assumed that cost outlays would be required for trail development and that net revenues would result from timber harvest. The costs of road construction were

appraised in the harvesting cost of the timber and thus accounted for in the estimates of net revenue from timber harvest. The analysis provided here is not a detailed economic analysis or cost-benefit analysis, but rather a simplified look at the anticipated direct public expenditures and revenue outcomes, particularly related to the sequence of the trail development and timber harvest actions. There are no links between the funding and revenues of the two proposed actions; they are funded and administered through different programs.

Trail Costs

For the purposes of the analysis, BLM estimated trail costs by tallying the costs of materials and labor required for construction of the trail network as proposed under each of the alternatives with trail construction, Alternatives 2, 3, and 4. The estimates, based on experience and data compiled by IMBA on recent projects, assumes implementation of the quality design and construction practices described in Section 2 and the inclusion of the specific technical trail features shown on the experience matrices (under Issue 1 in this section). Some comparison data and factors affecting costs are described in this section.

The cost to construct bike-optimized trails in the Pacific Northwest varies based on factors including, but not limited to, soil type, topography, vegetation, hydrology, targeted trail experience, intensity of use, season(s) of use, and the availability of qualified contractors. Construction costs frequently range from $5.00 - $12.00 per linear foot (LF); planning, design, and construction management costs range from 10% - 20% of construction costs. Based on recent projects in western Oregon and elsewhere in the U.S., costs for the Willamalane ERMA trails are projected to range from $7.50 - $10.00 per LF for professional construction. Many of the trails in the project area were designed to weave into the Riparian Reserves to take advantage of the mature canopy and soil conditions that would persist over time. These areas tend to have flatter, wetter areas that would require trail amendments of crushed rock or tread elevation, both of which increase costs, in the range of 6 to 25 percent per LF.

Professional trail builders typically use small mechanized equipment such as mini-excavators, mini-dozers, and tracked haulers. Larger mechanized equipment would probably be used for trails constructed on top of spur roads in order to move or modify the configuration of the compacted rock road base. Hand labor by a professional trail construction crew would accomplish the corridor clearing and finish tread work.

Table 6. Thurston Hills Trail Development Matrix: ALTERNATIVE 2 - TRAIL DEVELOPMENT ONLY

Segment Number	Segment Length (miles)	Primary Experience	Difficulty	Management Controls	Primary Route Designation	Trail Width (in.)	Technical Trail Features	Construction Cost Estimate
1	0.95	Challenge	Advanced	Directional	Bicycling	36	Rollers, drops, jumps, steep roll-downs, rock gardens	$ 37,456
2	1.50	Escape	Intermediate	Bi-directional	Bicycling	24	Rollers, rock gardens	$ 67,394
3	0.71	Play	Intermediate	Directional	Bicycling	30	Rollers	$ 28,022
4	0.79	Play	Intermediate	Directional	Bicycling	36	Rollers, jumps	$ 31,223
5	1.37	Play	Intermediate	Bi-directional	Bicycling/Hiking	36	Rollers, rock gardens	$ 54,096
6	0.76	Challenge	Advanced	Directional	Bicycling	30	Steep grades, rollers, jumps, drops, rock gardens	$ 30,253
7	0.45	Challenge	Advanced	Directional	Bicycling	36	Rollers, jumps, drops	$ 17,701
8	0.38	Efficiency	Intermediate	Bi-directional	Bicycling/Hiking	36		$ 14,896
9	0.72	Efficiency	Intermediate	Bi-directional	Bicycling/Hiking	36		$ 28,448
10	0.51	Play	Intermediate	Directional	Bicycling	36	Rollers	$ 20,028
11	0.35	Efficiency	Intermediate	Bi-directional	Bicycling/Hiking	36		$ 13,757
Total	**8.5**							**$ 343,275**

Table 7. Thurston Hills Trail Development Matrix: ALTERNATIVE 3 - TRAIL DEVELOPMENT and 165-ACRE REGENERATION HARVEST								
Segment Number	**Segment Length (miles)**	**Primary Experience**	**Difficulty**	**Management Controls**	**Primary Route Designation**	**Trail Width (inches)**	**Technical Trail Features**	**Construction Cost Estimate**
1	0.95	Challenge	Advanced	Directional	Bicycling	36	Rollers, drops, jumps, steep roll-downs, rock gardens	$ 37,456
2	1.50	Escape	Intermediate	Directional	Bicycling	24	Rollers, rock gardens	$ 67,394
3	0.71	Play	Intermediate	Directional	Bicycling	30	Rollers	$ 31,758
4	0.34	Challenge	Advanced	Directional	Bicycling	36	Steep grades, rollers, jumps, drops, rock gardens	$ 17,939
5	1.37	Play	Intermediate	Bi-directional	Bicycling/Hiking	36	Rollers, armoring	$ 59,505
6	0.76	Challenge	Advanced	Directional	Bicycling	30	Steep grades, rollers, jumps, drops, rock gardens	$ 34,287
7	0.45	Challenge	Advanced	Directional	Bicycling	36	Steep grades, rollers, jumps, drops, rock gardens	$ 23,601
8	0.38	Efficiency	Intermediate	Bi-directional	Bicycling/Hiking	36		$ 16,882
9	0.72	Efficiency	Intermediate	Bi-directional	Bicycling/Hiking	36		$ 32,242
10	0.51	Play	Intermediate	Directional	Bicycling	36	Rollers	$ 22,699
11	0.35	Efficiency	Intermediate	Bi-directional	Bicycling/Hiking	36		$ 15,591
12	0.25	Play	Intermediate	Directional	Bicycling	36	Rollers	$ 10,544
Total	**8.3**							**$ 369,900**

Table 8. Thurston Hills Trail Development Matrix: PREFERRED ALTERNATIVE 4 - TRAIL DEVELOPMENT and 109-ACRE REGENERATION HARVEST

Segment Number	Segment Length (miles)	Primary Experience	Difficulty	Management Controls	Primary Route Designation	Trail Width (inches)	Technical Trail Features	Construction Cost Estimate
1	0.95	Challenge	Advanced	Directional	Bicycling	36	Rollers, drops, jumps, steep roll-downs, rock gardens	$ 37,456
2	1.50	Escape	Intermediate	Bi-directional	Bicycling	24	Rollers, rock gardens	$ 67,394
3	0.71	Play	Intermediate	Directional	Bicycling	30	Rollers	$ 28,022
4	0.79	Play	Intermediate	Directional	Bicycling	36	Rollers, jumps	$ 31,223
5	1.37	Play	Intermediate	Bi-directional	Bicycling/Hiking	36	Rollers, rock gardens	$ 57,702
6	0.76	Challenge	Advanced	Directional	Bicycling	30	Steep grades, rollers, jumps, drops, rock gardens	$ 34,287
7	0.45	Challenge	Advanced	Directional	Bicycling	36	Rollers, jumps, drops	$ 17,701
8	0.38	Efficiency	Intermediate	Bi-directional	Bicycling/Hiking	36		$ 15,889
9	0.72	Efficiency	Intermediate	Bi-directional	Bicycling/Hiking	36		$ 32,242
10	0.51	Play	Intermediate	Directional	Bicycling	36	Rollers	$ 22,699
11	0.35	Efficiency	Intermediate	Bi-directional	Bicycling/Hiking	36		$ 15,591
Total	**8.5**							**$ 360,206**

Volunteers are frequently utilized during the construction process. This does not typically result in a cost reduction because the volunteers would not be expected to work at a professional level. The use of volunteers is therefore considered to be an opportunity for training and to build a network of supporters, and does not generally influence cost estimates.

Trail construction after harvest would cost approximately 6% - 25% more per LF than the cost to create the same riding experience in a pre-harvest situation. For the Thurston Hills project, the increase is approximately 9 percent. Increased costs vary due to several factors, including the following:

- The post-harvest landscape requires more effort to amplify the play and challenge experiences for riders. More rock armoring, more twists and undulations, and larger technical trail features all increase cost. Trail #3 (Play), for example, is estimated to cost $7.50 per LF in Alternatives 2 and 4, but $8.50 per LF in Alternative 3.
- Removing the mature evergreen canopy reduces the moderating effects the canopy has on the trail tread. The trail is more exposed to rainfall, wind, and sun, degrading it and reducing the number of weeks per year that the trail can be ridden. To counter this situation, amending the trail with crushed rock is recommended in many areas.
- The preserved aggregate retention buffers provide a moderate amount of mature evergreen canopy but would still be prone to greater exposure compared to the non-harvested condition. The increased cost to make the trails more weather-resistant in these areas is similarly moderate, typically in the range of a 6% - 10% increase. The construction techniques would vary depending on the situation but would likely include such practices as increasing the size and frequency of grade reversals and amending the trail with crushed rock.

Net Revenues from Harvest

The timber sale (Pedal Power) proposed under Alternatives 3, 4, and 5 would provide net revenue. The BLM estimates net revenue of a timber sale by the following formula:

> *Net Revenue = pond value of harvested timber (based on volume) minus logging costs, road costs, haul costs, and miscellaneous costs (such as fuel reduction costs and skid trail decommissioning)*

Net revenue is not the same as the proceeds sent to O&C Counties, which would be a portion of the net revenue, nor does it reflect the secondary benefits associated with employment during harvest, local spending, and the ultimate sale of timber products for the end user. However, it is an accurate and consistent way to estimate the relative "value" of timber produced from the project and differences among alternatives.

Environmental Effects

Alternative 1 – No Action

Direct and Indirect Effects

The No Action Alternative would not implement trail development or timber harvest. There would therefore be no costs or revenues associated with this alternative, and no direct, indirect or cumulative effects associated with it.

As described under the description of the No Action Alternative in section 2.1, it is reasonably foreseeable that the FO would reinitiate a timber harvest project in the Thurston Hills area in the next 10-20 years. Should a timber harvest alternative be chosen from that planning effort, revenue from the sale of timber would be generated at that time. Revenue generated from that effort would be analyzed in a future EA.

Alternative 2 – Trails Only

Direct and Indirect Effects

This alternative would develop approximately 8.5 miles of new designated non-motorized, single-track trails within the ERMA. No timber harvest would occur. This alternative therefore would have costs associated with trail development and no net revenues associated with timber harvest. The cost to build the trails under Alternative 2 would be approximately $ 343,275 and is shown in Table 9 in comparison to the other alternatives.

Table 9. Planning-level estimates of costs and net revenues of the action alternatives

	Alternative 2	Alternative 3	Alternative 4	Alternative 5
TRAIL CONSTRUCTION				
Cost ($)	343,275	369,900	360,206	0
Miles	8.5	8.3	8.5	0
Cost per mile ($)	40,267	44,566	42,377	0
ROADS ASSOCIATED WITH TIMBER HARVEST				
Cost ($) to Construct and Decommission		$ 117,183	$ 109,600	$ 118,008
NET REVENUE - TIMBER SALE ($) Net Revenue = pond value of harvested timber volume minus logging costs, road costs, haul costs, and misc. costs				
Net Revenue	0	$ 2,209,566	$ 1,360,540	$ 2,208,741
Harvest Acres	0	165	109	165
Net revenue per acre	0	$ 14,255	$ 13,605	$ 14,250

Cumulative Effects

Reasonably foreseeable similar actions within the analysis area within the next 10-15 years include WPRD expenditures on their hiking and mountain biking trail system, and BLM expenditures to maintain recreational facilities within the Eugene/Springfield area. Recreation

facility improvements would continue to be funded by a variety of sources including BLM-wide user fees and grants in order to provide public recreational benefits.

As described under the description of Alternative 2 in section 2.2, it is reasonably foreseeable that the FO would reinitiate a timber harvest project in the Thurston Hills area in the next 10-20 years. Should a timber harvest alternative be chosen from that planning effort, revenue from the sale of timber would be generated at that time, and costs to protect and repair the trail system would occur. Both revenue and cost would be analyzed in a future EA.

Alternative 3 – Trail Development and 165-Acre Regeneration Harvest

Direct and Indirect Effects

The costs of trail development and the net revenues from the timber harvest under Alternative 3 are shown in Table 9 in comparison to the other alternatives. The cost to build the trails under Alternative 3 would be approximately $369,900. This alternative has a higher cost-per-mile than the other trail alternatives because it has more trail mileage in the post-harvested regeneration units. As described for Alternative 3 under Issue 1, the post-harvest conditions would require a higher level of construction and the addition of technical trail features to achieve a similar range of experiences and levels of difficulty.

Cumulative Effects

Cumulative effects would be the same as those described under Alternative 3 relative to trail expenditures. Reasonably foreseeable similar timber sale revenues within the next 10-15 years would be anticipated from the annual implementation of timber sales as they progress through planning and analysis (see Cumulative Effects narrative under Issue 3 for Upper Willamette anticipated timber sales.) Timber sale revenues would continue to be generated for the O&C Counties for the benefit of the local economy.

Preferred Alternative 4 – Trail Development and 109-Acre Regeneration Harvest

Direct and Indirect Effects

The costs of trail development and the net revenues from the timber harvest for Alternative 4 are shown in Table 9 in comparison to the other alternatives. Not shown in the table are the costs associated with reconstructing any trail segments disturbed by future harvest actions in the 56-acre unit where trails would be developed first.

Cumulative Effects

Cumulative effects would be the same as those described under Alternative 2 for recreational expenditures and Alternative 3 for timber sale revenues.

Alternative 5 – 165-Acre Regeneration Harvest Only

Direct and Indirect Effects

Under Alternative 5, trails would not be developed, so there would be no costs associated with trail development. The net revenues from the timber harvest for Alternative 5 are shown in Table 9 in comparison to the other alternatives. Revenues from this alternative are slightly less than for Alternative 3 because Spur D would be fully decommissioned under this alternative.

Cumulative Effects

Cumulative effects would be the same as those described under Alternative 3 for timber sale revenues.

Issue 3: How would proposed timber harvest in the Thurston Hills project provide Allowable Sale Quantity (ASQ) timber volume for the Eugene SYU? How would the volume affect the ability to meet ASQ volume targets for the Eugene SYU?

The purpose and need for the Thurston Hills project includes "*Conduct commercial harvest to produce timber to contribute to the attainment of the declared ASQ*". To understand how each of the timber harvest alternatives would contribute to meeting this established purpose, the BLM calculated estimates of produced ASQ volume by alternatives.

The BLM used forest stand data from stand examinations conducted in the spring of 2017. The BLM silviculturist input this data into growth and yield models to produce estimated harvest volumes.

Affected Environment

The 2016 RMP established the required timber harvest - or allowable sale quantity (ASQ) - by BLM sustained yield unit (SYU). The Upper Willamette Field Office is in the Eugene SYU. The BLM prepares sale plans in advance of harvest because project planning and development take years. The estimated available ASQ changes whenever a timber sale drops in acres due to environmental conditions. If a harvest unit becomes unavailable due to site conditions discovered during project development, it takes years to develop a project that would replace the anticipated ASQ.

The spatial scale of analysis in this Issue is the HLB in the Eugene SYU. The volume target of the Eugene SYU is 53 mmbf per year to meet RMP requirements.

The BLM previously selected Modified Alternative 4 from the May 2018 EA, and the Pedal Power Timber Sale was sold in FY 2018, contributing 4.0 mmbf to the ASQ for the Eugene SYU. Selection of Alternative 3 or 5 would contribute additional volume, which would count toward FY 2020. Selection of the No Action Alternative or Alternative 2 would result in lost ASQ. Deferring commercial harvest in these stands now would forego the opportunity to contribute timber volume toward meeting the declared ASQ of 53 million board feet for these years.

Environmental Effects

Approximate harvest volumes in million board-feet (mmbf) per alternative are shown in Table 10 below.

Table 10. Estimated timber harvest volume by alternative

Approximate harvest volumes in mmbf by Alternative					
Alternative	**1**	**2**	**3**	**4**	**5**
Volume (mmbf)	0	0	6	4	6

Alternative 1 – No Action

The No Action Alternative would not implement trail development or timber harvest. This alternative would not contribute any volume to the Eugene SYU and thus not result in direct, indirect, or cumulative effects. Deferral of planned volume from the Thurston Hills project would forego the opportunity to contribute timber volume toward meeting the declared ASQ. This would cause the Eugene SYU to look for replacement volume from future projects for which pre-planning tasks currently occur, and for which planning tasks have not begun. Because of the lengthy lead time required to complete these tasks, the Eugene SYU would be under extreme pressure to complete environmental analysis early enough to provide an adequate time frame for sale preparation prior to timber sale date. The Eugene SYU would not have met the expected ASQ of 53 mmbf for fiscal year 2018.

As described under the description of the No Action Alternative in section 2.1, it is reasonably foreseeable that the FO would reinitiate a timber harvest project in the Thurston Hills area in the next 10-20 years. Should a timber harvest alternative be chosen from that future planning effort, ASQ from the sale of timber would be generated at that time.

Alternative 2 – Trails Only

This alternative would develop trails but no timber harvest would occur. Similar to the No Action Alternative, this alternative would not contribute any volume to the Eugene SYU and the BLM would not have met the expected ASQ in FY 2018.

As described under the description of Alternative 2 in section 2.2, it is reasonably foreseeable that the FO would reinitiate a timber harvest project in the Thurston Hills area in the next 10-20 years. Should a timber harvest alternative be chosen from that planning effort, ASQ from the sale of timber would be generated at that time.

Alternative 3 – Trail Development and 165-Acre Regeneration Harvest

Direct and Indirect Effects

This alternative would contribute approximately 6 mmbf, representing approximately 12 percent of the Eugene SYU annual total ASQ target of 53 mmbf for FY 2018. If selected, the additional volume beyond that from Alternative 4 (2 mmbf) would contribute to fiscal year 2020.

Cumulative Effects

Cumulative effects for this issue are relevant at the scale of the SYU and for fiscal years 2018 and 2020, the year in which Pedal Power originally sold, and the year in which it is assumed any additional volume would be sold. Timber sales planned within the Eugene SYU for the years 2018 and 2020 would contribute to the ASQ volume. Timber sales planned or analyzed which would contribute to ASQ within the analysis period include those encompassed by the following EAs: the Upper Siuslaw Landscape Project, Nails Creek, South Siuslaw, Row River, Shotcash, London Road, King Mosby, and Marcola Sunrise. These other reasonable foreseeable sales are part of the BLM's project planning on the Eugene Sustained Yield unit to meet the ASQ established by the 2016 RMP. Therefore, while this sale would not individually meet the

required ASQ, this alternative would contribute as part of the whole to that volume. The continual pattern of timber sale planning, analysis, and implementation would continue into the future in order to provide enough timber volume to meet the annual ASQ targets for the Eugene SYU.

Preferred Alternative 4 – Trail Development and 109-Acre Regeneration Harvest

Direct and Indirect Effects

This alternative contributed approximately 4 mmbf, representing approximately 7.5 percent of the Eugene SYU annual total ASQ target of 53 mmbf for fiscal year 2018.

Cumulative Effects

The cumulative effects analysis is the same as that provided under Alternative 3.

Alternative 5 – 165-Acre Regeneration Harvest Only

Direct and Indirect Effects

This alternative would be the same as Alternative 3, contributing approximately 6 mmbf of timber volume, which represents 12 percent of the Eugene SYU annual total ASQ target of 53 mmbf for FY 2020. As with Alternative 3, additional volume beyond that from Alternative 4 (2 mmbf) would contribute to fiscal year 2020.

Cumulative Effects

The cumulative effects analysis is the same as that provided under Alternative 3.

Issue 4: How would proposed regeneration harvest change the age-class distribution within the Upper Willamette Field Office and the Eugene SYU?

Affected Environment

Figures 3 and 4 below shows the current age class distribution of HLB acres in the Upper Willamette Field Office and the Eugene SYU, respectively. The figures show that the 0-10 year age class is under-represented and the 50-70 year age class is over-represented at both scales.

Figure 3. Current age class distribution of the Upper Willamette Field Office HLB

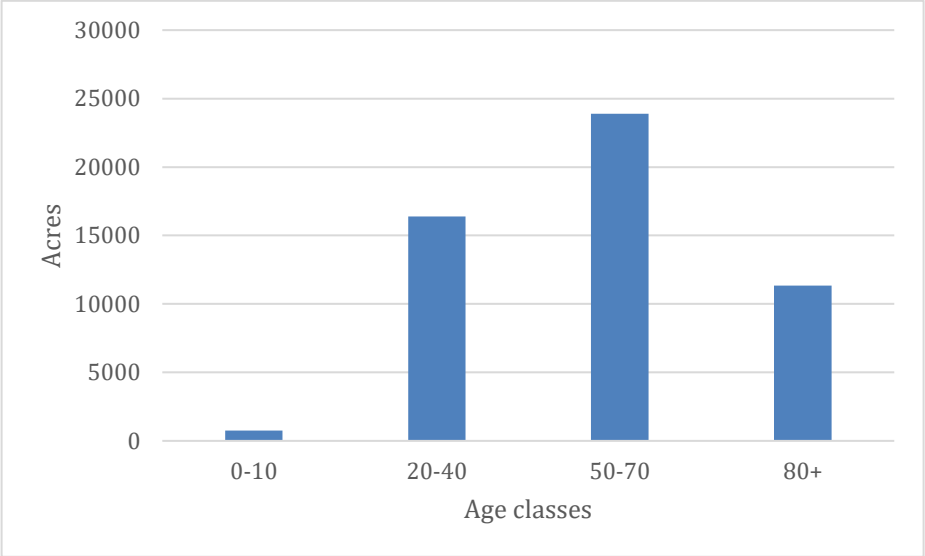
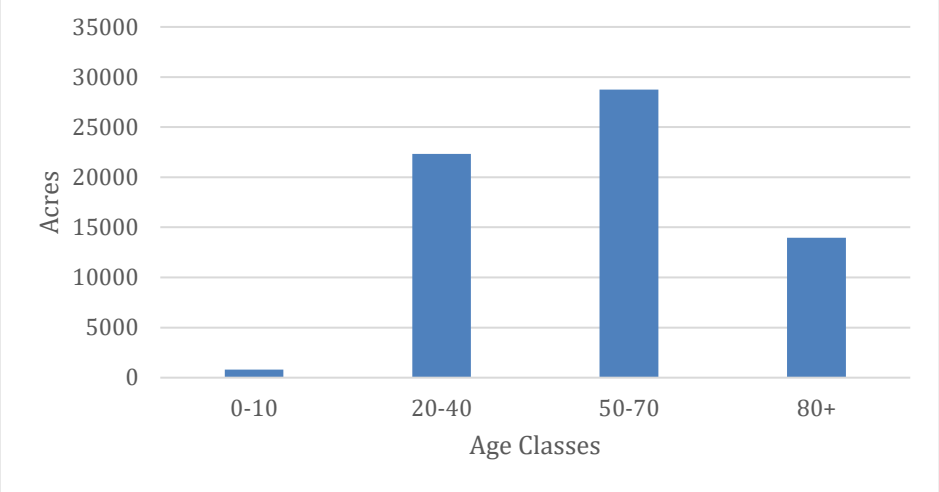


Figure 4. Current age class distribution of the Eugene SYU HLB



Environmental Effects

Alternative 1 – No Action

Direct and Indirect Effects

The No Action Alternative would not implement trail development or timber harvest. As such, this alternative would not increase the 0-10 year age class nor would it decrease the 70-year age class. The current age class distribution would not change. This alternative would thus not result in direct, indirect, or cumulative effects.

As described under the description of the No Action Alternative in section 2.1, it is reasonably foreseeable that the FO would reinitiate a timber harvest project in the Thurston Hills area in the next 10-20 years. Should a timber harvest alternative be chosen from that planning effort, the 0-

10 year age class would increase, with the amount dependent upon the size (acres) of harvest chosen.

Alternative 2 – Trails Only

Direct and Indirect Effects

This alternative would develop trails but no timber harvest would occur. As such, this alternative would not increase the 0-10 year age class nor would it decrease the 70-year age class. The current age class distribution would not change. This alternative would thus not result in direct, indirect, or cumulative effects.

As described under the description of Alternative 2 in section 2.2, it is reasonably foreseeable that the FO would reinitiate a timber harvest project in the Thurston Hills area in the next 10-20 years. Should a timber harvest alternative be chosen from that planning effort, the 0-10 year age class would increase, with the amount dependent upon the type and amount of harvest chosen.

Alternative 3 – Trail Development and 165-Acre Regeneration Harvest

Direct and Indirect Effects

In this alternative, 165 acres would be regeneration harvested from the 70-year age class. At the scale of both the Upper Willamette Field Office and the Eugene SYU, this alternative would increase the 0-10 year age class by 165 acres (a 36 percent increase at the Field Office level and a 32 percent increase at the SYU level) and it would decrease the 70-year age class by 165 acres (a 0.6 percent reduction at the Field Office level and a 0.5 reduction at the SYU level).

Cumulative Effects

Alternative 3 combined with other regeneration harvests in the Upper Willamette Field Office and the Eugene SYU would result in a trend of increased HLB acres in the 0-10 year age class. For fiscal year 2020 these combined acres would total approximately 1,237. As future regeneration harvests become planned and implemented over time, the HLB acres in the 0-10 year age class would move into the 20-40 year age class, and successively into the 40-60 age class, for a more even distribution of ages across the age classes. This is the trend anticipated by the RMP.

Volume 1 of the FEIS (p. 316) describes that by implementing timber sales in the HLB in MITA as proposed in the PRMP, the age class distribution across the planning area by 2113 would generally trend towards an equal number of acres in each age class. Intrinsic to the assumptions for sustained yield harvest, this correlated to an overall increase in net timber inventory over the next 100 years (FEIS, Volume 1, p. 316).

Preferred Alternative 4 – Trail Development and 109-Acre Regeneration Harvest

Direct and Indirect Effects

In this alternative, 109 acres would be regeneration harvested from the 70-year age class. At the scale of both the Upper Willamette Field Office and the Eugene SYU, this alternative would increase the 0-10 year age class by 109 acres (a 23 percent increase at the Field Office level and

a 20 percent increase at the SYU level) and it would decrease the 70-year age class by 109 acres (a 0.4 percent reduction at both the Field Office and SYU levels).

Cumulative Effects

Alternative 4 combined with other regeneration harvests in the Upper Willamette Field Office and the Eugene SYU would result in a trend of increased HLB acres in the 0-10 year age class. For fiscal year 2020, these combined acres would total approximately 1,181. As future regeneration harvests become planned and implemented over time, the HLB acres in the 0-10 year age class would move into the 20-40 year age class, and successively into the 40-60 age class, for a more even distribution of ages across the age classes. As noted under the cumulative effects analysis for Alternative 3, this is the trend anticipated by the RMP resulting in an increase in net timber inventory to provide sustained harvest levels.

Alternative 5 – 165-Acre Regeneration Harvest Only

Direct and Indirect Effects

This alternative would be the same as Alternative 3, increasing the 0-10 year age class by 165 acres and decreasing the 70-year age class by 165 acres.

Cumulative Effects

The cumulative effects analysis is the same as that provided under Alternative 3.

Issue 5: How would trail development, timber harvest, and reforestation affect fire risk?

Background:

Fire risk is the potential for realization of adverse or beneficial consequences to highly valued resources and assets (FEIS, p. 264). In terms of wildfire, an assessment of risk evaluates the interaction of wildfire hazard (likelihood and intensity), exposure (susceptibility) and effects on those values (e.g., where people live, timber resources, habitat, etc.). The BLM-administered lands in the vicinity of the project area are typically located in the foothills and mountains surrounding inhabited valley bottomlands and are closely intermixed with small towns, rural residential areas, and private and industrial forests. This is an area commonly referred to as the Wildland Urban Interface. The Healthy Forest Restoration Act (2003) provides latitude to Community Wildfire Protection Plans for refining their Wildland Urban Interface (WUI) boundary. The Lane County Community Wildfire Protection Plan (CWPP) has identified the Thurston Hills project area as WUI.

The Lane County CWPP and the 2016 FEIS analyzed fire risk for the Thurston Hills project area using different methodologies.

Fire risk for the Thurston Hills project area as identified by the Lane County CWPP is Moderate to High. The Lane County CWPP evaluated wildland-urban interface Fire Risk by analyzing four key “layers” of wildfire information. These layers are:

- Risk: Assesses the potential and frequency that wildfire ignitions may occur by analyzing historical ignitions over the past 10 years.
- Hazard: The natural conditions including vegetative fuels, weather, topographic features that may contribute to and affect the behavior of wildfire.

- Values: The people, property, and essential infrastructure that may suffer losses in a wildfire event.
- Protection Capability: The ability to plan and prepare for, as well as respond to and suppress, structural and wildland fires.

Through comparison and analysis of these layers, this assessment categorizes areas that are at a high, moderate, or low potential to be impacted by a wildfire within the WUI. The risk assessment team divided the WUI into five assessment areas, and the Thurston Hills project area is in the McKenzie River watershed, Assessment Area 4. Within this risk assessment area, Springfield is identified as a community at risk and Thurston Hills,79th Street, and Cedar Flat are identified as areas of concern (Lane County CWPP, p. 2-11).

Fire Risk for the Thurston Hills project area is categorized in the 2016 FEIS as Moderate. The 2016 FEIS determined fire risk based on wildfire hazard potential and proximity to the wildland developed areas (FEIS p. 266). Because there is not a standardized methodology for determining WUI boundaries, the 2016 FEIS assumed that a one-mile buffer around the West Wide Wildfire Risk Assessment Wildland Development Areas data layer (WWRA 2013) represents the geographic scope of possible immediate risks to the public and firefighter safety within close proximity to communities located within the WUI. This one-mile buffer is referred to as the Wildland Developed Area (WDA). Using this method, fire risk inside the WDA is higher than outside the WDA. Wildland hazard potential (WHP) is a model used to depict the relative probability of experiencing extreme fire behavior with torching and crowning, and the potential for wildfire that would be difficult for suppression resources to contain during weather conditions favorable for fire growth. The project area has a low WHP and lies entirely inside the WDA, thus the FEIS identified the current fire risk in the project area as Moderate.

Methodology:

This analysis is using the methodology of the Lane County CWPP instead of the methodology of the 2016 FEIS because of the site-specific characteristics of the local area:

- the entire area is within the WDA
- the entire area is covered by the Lane County CWPP
- the values are unusual for BLM-administered lands because of the abundance of residences and infrastructure near the project area

As detailed above, the fire risk methodology of the Lane County CWPP includes the four components of risk, hazard, values, and protection capability.

- The risk component is analyzed by evaluating changes in public use in the project area, which has the potential to affect the probability of human-caused fires.
- The hazard component is analyzed by evaluating the short-term changes in forest structural stage, which represents changes in fuel conditions in the project area. That analysis is summarized from the Fire Hazard analysis (Issue 6).
- The values component would not be affected by the proposed action. The values involved are primarily residences and infrastructure. The location and abundance of residences and infrastructure would not be affected by the proposed action. The potential for ignition of a residence is determined primarily by the conditions within the home ignition zone: the area encompassing a home and its immediate surroundings (Cohen 2008). A home's ignition potential during wildfires is determined by the characteristics of its exterior

materials and design, and their response to burning objects within one hundred feet and firebrands. The proposed action would have no effect on these conditions. Therefore, this component of risk would be the same under all alternatives, including the No Action alternative.

- The protection capability component is analyzed by evaluating changes in access in the project area, which would affect the effectiveness of wildfire suppression efforts.

For the Thurston Hills project, the BLM gathered site-specific information from a combination of site visits, stand exams, GIS datasets, and fire modeling tools. The BLM also used historic conditions, biophysical settings, and vegetation condition class data from LANDFIRE[7]. The BLM collected information on urban development and future planning information from the Lane County Community Wildfire Protection Plan (CWPP), Thurston Hills natural area management plan, Rivers to Ridges vision plan, and Eugene/Springfield metro plan. The BLM conducted site visits from 2017 through 2019. The Willamalane Park and Recreation District provided the BLM with visitor use information for the Thurston Hills Natural Area.

The BLM utilized OR Wildfire Risk Explorer to generate advanced risk reports for the Thurston Hills and surrounding areas displaying metrics on housing density, potential impacts from wildfire, burn probabilities, etc. The BLM utilized the Interagency Fuel Treatment Decision Support System (IFTDSS) to evaluate and compare current versus postharvest stand conditions and potential fire behavior. These reports are summarized in this analysis, incorporated herein by reference, and are available upon request from the BLM's Springfield Interagency Office.

Assumptions:

- For the purpose of this analysis, the BLM assumes that trail development on the Thurston Hills project area would have the same use patterns as the Thurston Hills Natural Area managed by the Willamalane Park and Recreation District. Trail user counts collected by Willamalane show that on average 80-100 people visit the Thurston Hills Natural Area trail system each day (Gallimore 2020).
- For the purpose of this analysis, the BLM assumes that increased public use as a result of constructing recreation trails would not change the likelihood of human-caused ignitions. The effect of public use on the likelihood of human-caused ignitions is complex, as illustrated by the ODF data[8] on wildfire ignitions in this sub-watershed. Most wildfires in this sub-watershed and statewide are human caused, but the source of the ignitions is varied. Whether public use increases or decrease the likelihood of ignition depends on the type of public use. Recreational activities such as overnight camping can increase the likelihood of ignition from campfires. However, other recreational activities, such as hiking and biking do not increase the likelihood of ignition, and decrease the likelihood of ignition from illegal activities, such as arson and illegal camping. The BLM bases this conclusion on experience with similar projects: Cathedral Hills Park and Stewart Pond Disc Golf area.
    - Cathedrals Hills Park is a multi-use trail system near Grants Pass. In recent years, the trail underwent renovations which dramatically increased visitor use. Surveys show that on average 40-60 people visit the trail system each day (Gallimore

[7] LANDFIRE is a landscape Fire and Resource Management Planning Tools Project) is an interagency Program producing consistent and comprehensive data describing landscape change, disturbance, vegetation, fuel, and fire regimes across the United States.
[8] Oregon Department of Forestry fire data is reported annually and becomes part of BLM's corporate GIS data.

2020). Despite the large increase of users, there has been no measurable increase in human-caused fires. Over the past 20 years, the Cathedral Hills Trail System has experienced only three small human-caused fires. All three were detected and controlled at less than 1/10 of an acre.

- Stewart Pond Disc Golf area is a BLM parcel within the Eugene city limits. This overgrown parcel became an illegal camping area. The Eugene-Springfield fire department responded to approximately 50 fire starts on this parcel each summer. In 2014, an extensive cleanup and thinning operation occurred, and in 2015 the area was developed into a disc golf course. The disc golf course and associated walking trails are heavily visited by 30-50 people per day, and fire starts have decreased dramatically (Gallimore 2020). In 2017, the Eugene-Springfield fire department responded to 3-5 reported starts on this parcel.

Overall, the BLM assumes that trail construction would not change the likelihood of ignition because any increased likelihood resulting from biking, hiking, or walking on the trails would be at least balanced by a decreased likelihood of ignition from illegal activity, such as arson and illegal camping.

- For the purpose of this analysis, the BLM assumes that there would be no change in fuel conditions on adjacent non-BLM-administered lands within one-quarter mile of the project area. Although the Willamalane Park and Recreation District has begun some fuel reductions treatments in the Thurston Hills Natural Area, as identified below under Affected Environment, there is no basis for projecting any change in fuel conditions on private properties within one-quarter mile of the project area. Therefore, the BLM assumes for the purpose of this analysis that changes in fire risk associated with the hazard component at the local scale are represented by changes in hazard within the project area (see the Fire Hazard analysis).
- Over the next 10 years, the land surrounding BLM-administered lands will continue to be urbanized. Thus, residential and recreational development will continue to increase. The City of Springfield and Lane County have adopted a coordinated population forecast that estimates the population east of I-5 to be over 81,000 by 2030.
- Treatment of activity fuels in strategic locations (such as along main access routes, ridges, or property lines) would slow the spread and decrease the flame length of potential fires, increasing the likelihood that wildfires would be suppressed during initial attack.
- Construction of trails and roads and development of access points to BLM-administered lands would increase access for wildfire suppression, and increased access would improve the effectiveness of wildfire suppression.

Spatial scale:

This analysis evaluates fire risk at the local scale, which includes the BLM-administered lands in the Thurston Hills project area, as well as structures and infrastructure that could be affected if a wildfire were to occur on the BLM-administered lands in the Thurston Hills project area. The local scale extends to structures and infrastructure within one-quarter mile of the project area, because the potential impacts of short-range spotting from burning embers during a wildfire is one-quarter mile. There are multiple residences and structures within one-quarter mile of the

BLM-administered lands in T. 17 S., R 01 W., Section 31 and T. 18 S., R 02 W Section 01. Additionally, there are transmission lines running through the BLM-administered lands in T. 17 S., R 01 W. This local scale highlights the number of off-site and on-site values at risk compared to the larger WDA. The local scale encompasses a total of 1,520 acres, of which BLM manages 394 or approximately 26% of the area (Gallimore 2020).

The BLM considered analyzing fire risk at the project scale, which is smaller than the local scale. The project scale would be only the BLM-administered lands in the Thurston Hills project area proposed for timber harvest or trails. However, the project area alone does not encompass the values component of fire risk, which is primarily the nearby residences and infrastructure. Therefore, this analysis does not analyze fire risk at the project scale. (Note that the Fire Hazard analysis does address the hazard component of fire risk at the project scale – see the Fire Hazard analysis).

The BLM also considered analyzing fire risk at the sub-watershed scale, which is broader than the local scale. The sub-watershed is the sixth-field sub-watershed (also referred to as HUC12) level. The project is located within the Walterville Canal sub-watershed, which is a smaller piece of the larger McKenzie River watershed. The sub-watershed encompasses a total 33,737 acres, of these acres BLM manages 2,904 acres or approximately 9 percent of the area. The 93-165 acres of proposed harvest and activity fuels treatments represents approximately 3-5 percent of BLM-administered lands in this sub-watershed. Across all ownerships in the sub-watershed, the proposed harvest represents approximately 0.3-0.5 percent of the landscape. Because the project affects less than one half of 1 percent of the sub-watershed, there would be no discernable differences in effects to fire risk between the alternatives at this scale of analysis. Therefore, this analysis does not analyze fire risk at the sub-watershed scale.

Temporal scale:

This analysis evaluates fire risk at the temporal scale of 0-10 years. Changes in public use and access (and the attendant changes in the risk and protection capability component) would occur as soon as the project is implemented. The hazard component of fire risk is based on the short-term effects on fire hazard presented in the Fire Hazard analysis, which explains that the short-term effects are defined as 10 years. This temporal scale is based on the time it would take for activity-generated fine fuels (less than three inches diameter) to degrade (McIver and Ottmar 2007). (Note that the Fire Hazard analysis addresses the hazard component of fire risk at short-term, intermediate, and long-term timeframes – see the Fire Hazard analysis).

Affected Environment:

As explained above, the current overall fire risk is categorized as Moderate to High. The Lane County CWPP identifies that this existing fire risk is a result of extensive fuels, steep slopes, and the presence of residences and infrastructure.

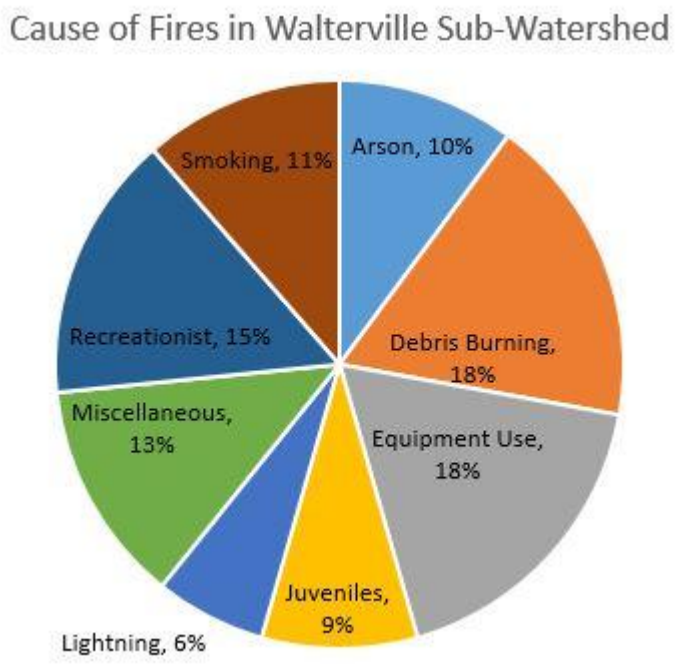
The Thurston Hills area is heavily influenced by urban growth and development. The lands surrounding the project area are steadily transitioning from rural to urban land use. The Thurston Hills area is located approximately ¼ mile east of Springfield's city limits. The northeast quarter of T. 17 S., R 01 W., Section 1 is located within Springfield's Urban Growth Boundary. The western property line is bordered by Willamalane's Thurston Hills Natural Area, which is being developed for public access and recreation opportunities. The north, east, and south property

lines currently have multiple residences and structures located within a ¼ mile of the project area.

Willamalane Park and Recreation District is developing their property consistent with the Thurston Hills Natural Area Management Plan (January 2017). The plan emphasizes the development of walking, hiking, and mountain biking opportunities, while preserving views and enhancing wildlife habitat and sensitive natural areas. Public use of the Thurston Hills Natural Area will continue to increase as recreation opportunities are developed and population growth increases.

In the spring of 2018, Willamalane began fuels reduction and prairie/oak restoration activities in the Thurston Hills Natural Area. Along with on-the-ground treatments, Willamalane will also conduct community outreach, public education, and firewise programs. These actions are intended to reduce the chances of human-caused fires and thus reduce fire risk in the area.

Fire statistics recorded by ODF from 1960 thru 2016 show that 94 percent of fires in this sub-watershed are human caused. According to reports from OR Wildfire Risk Explorer statewide, 71 percent of fires recorded by ODF are human caused. The Thurston Hills area has a high probability of human caused fires compared to the statewide average. Over the next 10 years, there will likely be a slight increase in the likelihood of human-caused fires, as the population increases and urbanization continues in the local area. The extent of this trend is difficult to gauge, as there is no way of forecasting the amount of new homebuilding, building design, or infrastructure design and placement within the local area.



There have been no large fires (100+ acres) within the project, local, or sub-watershed scales. Fire statistics recorded by ODF from 1960 to 2016 show that approximately 97% percent of wildland fires in the sub-watershed were suppressed at less than 10 acres.

Environmental Effects:

Alternative 1 - No Action

Under the No Action Alternative, the BLM would not construct trails or harvest timber at this time. Although it is reasonably foreseeable that the BLM would harvest timber in the project area in the future given the allocation of the area to the Harvest Land Base, it is not reasonably foreseeable that such future timber harvest would be implemented within the ten-year temporal scope of this fire risk analysis (see Assumptions in the Fire Hazard analysis). Over the next ten years, there would be —

- no change in fire risk associated with the risk component, because there would be no change in public use;
- no change in fire risk associated with the hazard component, because there would be no change in the forest structural stages over the next ten years, as detailed in in the Fire Hazard analysis;
- a slight increase in fire risk associated with the values component, which would occur under any alternative, because of the likely increased presence of residences and infrastructure; and
- no change in fire risk associated with the protection capability component, because there would be no change in access.

Overall, the fire risk would remain Moderate to High under the No Action alternative. Although there would be a slight increase in fire risk associated with the values component (which would occur under any alternative), there would be no change over the next ten years in any of the other components of fire risk. As a result, neighboring homeowners would continue to experience the same overall fire risk over the next ten years that they currently experience. There would be no meaningful or measurable change in the likelihood of an ignition. And if a wildfire were to occur on the BLM-administered lands of the project area, there would be no change in the fire hazard caused by the fuels in the project area and no change in the ability to suppress the wildfire.

Alternative 2 – Trails Only

Under Alternative 2, the BLM would construct trails but would not harvest timber at this time.

There would be no change in fire risk associated with the risk component, because the increased public use would be primarily from mountain bikers, hikers, and walkers using the trails. As explained above under assumptions, this increase in public use would show similar use patterns as the Thurston Hills Natural Area: 80-100 people per day.

There would be no change in fire risk associated with the hazard component, because there would be no change in the forest structural stages over the next ten years, as detailed in in the Fire Hazard analysis. The effect of Alternative 2 on the hazard component would be the same as the No Action alternative.

There would be a slight increase in fire risk associated with the values component, which would occur under any alternative, because of the likely increased presence of residences and infrastructure.

There would be a slight decrease in fire risk associated with the protection capability component, because of increased notification and access. Construction of trails would increase public use and thereby increase the likelihood of early notification in the event of a wildfire. Early notification would increase the probability that suppression efforts would be successful. Construction of

trails and access points under Alternative 2 would increase access to wildland areas and improve opportunities for firefighters to quickly respond and suppress fires.

Overall, the fire risk would remain Moderate to High under Alternative 2. There would be no change in fire risk associated with the risk and hazard components over the next ten years. There would be a slight increase in fire risk associated with the values component (which would occur under any alternative), but there would be a slight decrease in fire risk associated with the protection capability component. These slight and countervailing changes in fire risk are insufficient to alter the current fire risk category at the local scale. As a result, neighboring homeowners would continue to experience the same overall fire risk over the next ten years that they currently experience, similar to the No Action alternative. There would be no meaningful or measurable change in the likelihood of an ignition. If a wildfire were to occur on the BLM-administered lands of the project area, there would be no change in the fire hazard caused by the fuels in the project area and a slight improvement in the ability to suppress the wildfire.

Alternative 3 – Trail Development and 165-Acre Regeneration Harvest

Under Alternative 3, the BLM would implement regeneration harvest on 155 acres and then reforest the harvested areas. The BLM would construct trails after timber harvest.

There would be no change in fire risk associated with the risk component, because the increased public use would be primarily from mountain bikers, hikers, and walkers using the trails. As explained above under assumptions, this increase in public use would show similar use patterns as the Thurston Hills Natural Area: 80-100 people per day. The effect of Alternative 3 on the risk component would be similar to Alternatives 2 and 4.

There would be an immediate and initial change in fire risk associated with the hazard component, because timber harvest would create fuels and change the forest structural stage as detailed in in the Fire Hazard analysis. On 89 acres, timber harvest would change the structural stage from Young – High Density to Early Successional, which represents an initial decrease in fire hazard from High to Moderate. On 76 acres, timber harvest would change the structural stage from Mature to Early Successional, which represents an initial change in fire hazard from Mixed to Moderate. (Mixed fire hazard indicates the potential to exhibit the full range of hazard categories from High to Low (FEIS, p. 254), which makes it difficult to characterize this initial change in hazard to Moderate as an increase or decrease). Following reforestation and stand growth, these stands would later develop into Stand Establishment, which represents a fire hazard category of High. Therefore, by the end of the ten-year timeframe, all 165 acres of harvested stands would have a fire hazard of High, which would represent an increase in fire risk associated with the hazard component. This increase in fire risk associated with the hazard component would be consistent with the analyses of the effect of timber harvest and residual activity fuels on fire hazard in the FEIS (pp. 253-270) to which this analysis is tiered, and those analyses are incorporated here by reference (and see the Fire Hazard analysis in section x.x).

There would be a slight increase in fire risk associated with the values component, which would occur under any alternative, because of the likely increased presence of residences and infrastructure.

There would be a decrease in fire risk associated with the protection capability component, because of increased notification and access. Construction of trails would increase public use and thereby increase the likelihood of early notification in the event of a wildfire. Early notification

would increase the probability that suppression efforts would be successful. Construction of trails and access points under Alternative 3 would increase access to wildland areas and improve opportunities for firefighters to quickly respond and suppress fires, similar to Alternative 2. Also, road construction and renovation under Alternative 3 would provide additional improvements in access.

Overall, the fire risk would remain Moderate to High under Alternative 3. There would be no change in fire risk associated with the risk component over the next ten years, even though there would be an increase in public use. There would be a slight increase in fire risk associated with the values component (which would occur under any alternative). There would be an increase in fire risk associated with the hazard component as a result of changes to the structural stage and the creation of residual activity fuels within the project area. There would be a decrease in fire risk associated with the protection capability component because of improved access. These countervailing changes in fire risk are insufficient to alter the current fire risk category at the local scale. As a result, neighboring homeowners would continue to experience the same overall fire risk over the next ten years that they currently experience, similar to the No Action alternative. There would be no meaningful or measurable change in the likelihood of an ignition. If a wildfire were to occur on the BLM-administered lands of the project area, there would be an increase in the fire hazard caused by the fuels in the project area but an improvement in the ability to suppress the wildfire.

Preferred Alternative 4 –Trail Development and 109-Acre Regeneration Harvest

Under Alternative 4, the BLM would implement regeneration harvest on 109 acres and then reforest the harvested areas. The BLM would construct trails after timber harvest.

There would be no change in fire risk associated with the risk component, because the increased public use would be primarily from mountain bikers, hikers, and walkers using the trails. As explained above under assumptions, this increase in public use would show similar use patterns as the Thurston Hills Natural Area: 80-100 people per day. The effect of Alternative 4 on the risk component would be similar to Alternatives 2 and 3.

There would be an immediate and initial change in fire risk associated with the hazard component, because timber harvest would create fuels and change the forest structural stage as detailed in in the Fire Hazard analysis. On 36 acres, timber harvest would change the structural stage from Young – High Density to Early Successional, which represents an initial decrease in fire hazard from High to Moderate. On 73 acres, timber harvest would change the structural stage from Mature to Early Successional, which represents an initial change in fire hazard from Mixed to Moderate. (Mixed fire hazard indicates the potential to exhibit the full range of hazard categories from High to Low (FEIS, p. 254), which makes it difficult to characterize this initial change in hazard to Moderate as an increase or decrease). Following reforestation and stand growth, these stands would later develop into Stand Establishment, which represents a fire hazard category of High. Therefore, by the end of the ten-year timeframe, all 109 acres of harvested stands would have a fire hazard of High, which would represent an increase in fire risk associated with the hazard component. This increase in fire risk associated with the hazard component would be consistent with the analyses of the effect of timber harvest and residual activity fuels on fire hazard in the FEIS (pp. 253-270) to which this analysis is tiered, and those analyses are incorporated here by reference. Because of the smaller acreage of harvest, this

increase in fire risk associated with the hazard component would be smaller than under Alternative 3 and 5.

There would be a slight increase in fire risk associated with the values component, which would occur under any alternative, because of the likely increased presence of residences and infrastructure.

There would be a decrease in fire risk associated with the protection capability component, because of increased notification and access. Construction of trails would increase public use and thereby increase the likelihood of early notification in the event of a wildfire. Early notification would increase the probability that suppression efforts would be successful. Construction of trails and access points under Alternative 4 would increase access to wildland areas and improve opportunities for firefighters to quickly respond and suppress fires, similar to Alternative 2. Also, road construction and renovation under Alternative 4 would provide additional improvements in access, though slightly less because of the slightly lower mileage of road renovation.

Overall, the fire risk would remain Moderate to High under Alternative 4. There would be no change in fire risk associated with the risk component over the next ten years, even though there would be an increase in public use. There would be a slight increase in fire risk associated with the values component (which would occur under any alternative). There would be an increase in fire risk associated with the hazard component as a result of changes to the structural stage and the creation of residual activity fuels within the project area, though slightly lower than Alternatives 3 and 5 because of the smaller harvest acreage. There would be a decrease in fire risk associated with the protection capability component because of improved access. These countervailing changes in fire risk are insufficient to alter the current fire risk category at the local scale. As a result, neighboring homeowners would continue to experience the same overall fire risk over the next ten years that they currently experience, similar to the No Action alternative. There would be no meaningful or measurable change in the likelihood of an ignition. If a wildfire were to occur on the BLM-administered lands of the project area, there would be an increase in the fire hazard caused by the fuels in the project area but an improvement in the ability to suppress the wildfire.

Alternative 5 – 165-acre Regeneration Harvest Only

Under Alternative 5, the BLM would implement regeneration harvest on approximately 165 acres and then reforest the harvested areas. The BLM would not construct trails.

There would be no change in fire risk associated with the risk component, because there would be no change in public use, similar to the No Action alternative.

There would be an increase in fire risk associated with the hazard component because timber harvest would create fuels and change the forest structural stage, similar to Alternative 3.

There would be a slight increase in fire risk associated with the values component, which would occur under any alternative, because of the likely increased presence of residences and infrastructure.

There would be a slight decrease in fire risk associated with the protection capability component, because of increased access. Road construction and renovation under Alternative 5 would increase access to wildland areas and improve opportunities for firefighters to quickly respond and suppress fires. However, unlike Alternatives 2, 3, and 4, the BLM would not construct trails

and access points. As a result, there would be no increase in public use and no increase the likelihood of early notification in the event of a wildfire.

Overall, the fire risk would remain Moderate to High under Alternative 5. There would be no change in fire risk associated with the risk component over the next ten years because there would be no change in public use. There would be a slight increase in fire risk associated with the values component (which would occur under any alternative). There would be an increase in fire risk associated with the hazard component as a result of changes to the structural stage and the creation of residual activity fuels within the project area. There would be a decrease in fire risk associated with the protection capability component because of improved access. These countervailing changes in fire risk are insufficient to alter the current fire risk category at the local scale. As a result, neighboring homeowners would continue to experience the same overall fire risk over the next ten years that they currently experience, similar to the No Action alternative. There would be no meaningful or measurable change in the likelihood of an ignition. If a wildfire were to occur on the BLM-administered lands of the project area, there would be an increase in the fire hazard caused by the fuels in the project area but a slight improvement in the ability to suppress the wildfire.

Summary:

Under all alternatives, including the No Action alternative, overall fire risk would remain Moderate to High at the local scale over the next ten years. Over this timeframe, there would be some changes among the alternatives in the individual components of fire risk, and these changes differ among the alternatives. The No Action alternative and Alternative 2 would not cause increases in fire risk associated with the hazard component over the next ten years, because they would not include timber harvest. Alternatives 3, 4, and 5 would cause increases in fire risk associated with the hazard component, because timber harvest would create fuels and change the forest structural stage. Alternatives 3, 4, and 5 would also cause decreases in fire risk associated with the protection capability component because of increased access. Alternatives 2, 3, and 4 would increase public use and thereby increase the likelihood of early notification in the event of a wildfire, increasing the probability that suppression efforts would be successful.

The magnitude of these changes in the individual components of fire risk are not sufficient to alter the overall fire risk category at the local scale over the next ten years for any alternative. As a result, neighboring homeowners would continue to experience the same overall fire risk over the next ten years that they currently experience under all alternatives.

Issue 6: How would trail development, timber harvest, and reforestation affect fire hazard?

Background:

Fire hazard is a fuel complex, defined by volume, type condition, arrangement, and location, that determines the degree of ease of ignition and of resistance to control (FEIS, p. 1070). In the 2016 FEIS, the BLM analyzed the effects of fire hazard close to developed areas for the Northwestern Oregon RMP planning area (FEIS, pp. 253-264). In that analysis, the BLM assigned forest structural stages (FEIS, Appendix C, pp.1203-1206) to a relative ranking of stand-level fire hazard (FEIS, Table 3-34, p. 254), Table 11 below.

Table 11. Stand-level fire hazard ratings by structural stage (FEIS, Table 3-34, p. 254)

Structural Stages	Subdivisions	Fire Hazard
Early Successional	with Structural Legacies	Moderate
	without Structural Legacies	Moderate
Stand Establishment	with Structural Legacies	High
	without Structural Legacies	High
Young Stands – High Density	with Structural Legacies	High
	without Structural Legacies	High
Young Stands – Low Density	with Structural Legacies	Moderate
	without Structural Legacies	Moderate
Mature	Single-Layered Canopy	Low
	Multi-Layered Canopy	Mixed
Structurally-complex	Developed Structurally-complex	Mixed
	Existing Old Forest	Mixed
	Existing Very Old Forest	Mixed

While the FEIS analysis did not specifically account for surface fuel loading, the BLM assumed that descriptions of forest vegetation structural conditions and fuel continuity reflect relative stand-level fire hazard. The BLM assumed in the 2016 FEIS that a one-mile buffer around the West Wide Wildfire Risk Assessment Wildland Development Areas (WDAs) data layer (WWRA 2013) represents the geographic scope of possible immediate risks to the public and firefighter safety close to communities located within the Wildland Urban Interface (WUI) (FEIS, p. 266). This one-mile buffer is referred to as the WDA. The BLM quantified the acreage of forested BLM-administered lands into fire hazard categories within the WDA over a 50-year period. That analysis identified that young stand establishment following a regeneration harvest of a mature stand would increase wildfire hazard for approximately 50 years on dry forest sites, and 30 to 50 years on moist forest sites (FEIS, pp. 255, 1203-1204).

The FEIS (p. 262), to which this EA is tiered, concluded that in 50 years, implementation of the timber harvest program under the RMP would result in a seven percent acreage net increase in the High or Moderate hazard category for the HLB in the coastal and north FEIS analysis area within the WDA. The Upper Willamette Field Office contains 52,953 acres of HLB, with the vast majority located within the WDA. The projected FEIS seven percent net acreage increase in the High or Moderate fire hazard category within the HLB over 50 years, equates to approximately 3,706 acres of increased fire hazard within the Upper Willamette Field Office by 2063. Additionally, the FEIS assumed 894 acres of regeneration harvest annually within the Upper Willamette Field Office, beginning in Fiscal Year 2017 (Gallimore 2020).

Starting in Fiscal Year 2017, the Upper Willamette Field Office has signed regeneration timber harvest Decision Records[9] (DRs) totaling 1,047 acres, approximately 350 acres per year, well below the 894 per year acre FEIS assumption of annual regeneration harvest. The Thurston Hills project would implement zero to 165 acres of regeneration harvest over a two-year contract term, adding approximately 0 to 83 (rounded) annual acres of regeneration harvest within the Upper

[9] Projects begun prior to the 2016 ROD/RMP, but decided after the 2016 ROD/RMP, may have been implemented consistent with the management direction of the 1995 RMP (ROD/RMP p. 10).

Willamette Field Office. Because the total annual regeneration harvest acres within the Upper Willamette Field Office would still be well below the acres of annual regeneration harvest assumed in the FEIS, the actual rate of increased fire hazard category acres is less than the FEIS projection by approximately 550 acres. Under any action alternative, the management actions that would affect fire hazard would be consistent with the analytical assumptions in the FEIS. Because actual timber harvest implementation within the Upper Willamette Field Office is below the modeling assumptions in the FEIS (p. 262) and timber harvests have been designed in conformance with the RMP, this project would not have effects on fire hazard beyond those disclosed in the FEIS to which this analysis is tiered.

Methodology:

The fire hazard unit of measure is forest structural change acres. Forest structural stages (FEIS, Appendix C, pp. 1203-1206) represent stand-level categories of fire hazard (FEIS, Table 3-34, p. 254). As such, forest structural stage is used in this analysis as a surrogate for a range of indicators related to fire hazard, including fire hazard category, fuel model, predicted flame length, rate of spread, and fire type. Stand-level fire hazard was analyzed in the FEIS (pp. 253-271), to which this EA is tiered. The assumptions, methodology, and findings are incorporated into this EA by reference. These categories range from High to Moderate fire hazard (i.e., relatively difficult to control) to Low fire hazard (i.e., relatively easy to control). The Mixed fire hazard category indicates the potential to exhibit the full range of hazard categories (High to Low).

For the Thurston Hills project, the BLM gathered site-specific information from a combination of site visits, stand exams, GIS datasets, and fire modeling tools. The BLM also used historic conditions, biophysical settings, and vegetation condition class data from LANDFIRE[10]. The BLM conducted site visits from 2017 through 2019. During these site visits, the BLM assessed existing and predicted fuel loading and fuels models. Ocular calculation of existing fuel loading was determined by BLM using photo series (Ward, 1980). Fuel models and expected fire behavior were determined by BLM from Standard Fire Behavior Fuels Models: A Comprehensive Set, for use with Rothermel's Surface Fire Spread Model (Scott and Burgan, 2005).

Assumptions:

- Forest structural stages reflect the stand-level fire hazard categories (FEIS, pp. 254-255).
- Timber harvest would affect fire hazard at the project scale, because timber harvest would create fuels. By generating residual activity fuels, timber harvest has the potential to increase fire risk associated with the hazard component if not adequately treated (Agee 1993, Weatherspoon and Skinner 1995, Raymond and Peterson 2005) (see the Fire Risk analysis). Post-harvest fuels treatments reduce activity fuels and potential fire behavior. Following slash disposal treatments, a reduction in potential fire behavior would occur due to the reduction in surface fuel loading and change in horizontal and vertical fuel arrangement.

[10] LANDFIRE (Fire and Resource Management Planning Tools Project) is an interagency program producing consistent and comprehensive data describing landscape change, disturbance, vegetation, fuel, and fire regimes across the United States.

- The BLM will treat portions of residual activity fuels following timber management activities for both site preparation and hazardous fuels reduction purposes.
- In whole tree harvesting, the entire cut tree is yarded to the landing, with disposal of limbs and tops at the landing. Whole tree harvesting is the most effective method for limiting the increase in surface fuels within the harvested stand, because limbs and tops are taken to the landing rather than being cut off and left on the forest floor (Agee and Skinner 2005). At the landings, limbs and tops would be piled and then chipped, removed for biomass, sold for firewood, or burned.
- If stands in the project area are not harvested at this time (as described for 165 acres under the No Action Alternative and Alternative 2, and for 56 acres under Alternative 3), it is reasonably foreseeable that the BLM would implement regeneration harvest in 10 to 20 years in the project area. The 2016 RMP allocated the project area to the HLB, which the BLM will manage for sustained-yield timber production. If not harvested now, it is unlikely that the BLM would implement regeneration harvest in the short term, because of the practical limitations associated with designing, analyzing, and preparing new timber sales. However, it is highly probable that the BLM would implement regeneration harvest in 10 to 20 years because of the past harvest rotation patterns, projected volume growth, and future stand ages of proposed units. Therefore, this analysis assumes that there would be no timber harvest in the project area during the short term (0 to 10 years), but that there would be regeneration harvest during the intermediate term (10 to 30 years) under the No Action Alternative and Alternative 2, and for the unharvested portions of the project area under Alternative 3.
- Timber management on adjacent private lands will continue at the current pace and scale.
- Trail development would not alter the fire hazard at the project scale, because trail development would not change the structural stage, fuel model, or fuel loadings at the stand scale. Note that the effects of trail development are addressed in the Fire Risk analysis.

Spatial scale:

This analysis evaluates fire hazard at the project scale, which is the BLM-administered lands in the Thurston Hills project area proposed for timber harvest or trails. The direct and indirect effects of the proposed action on fuel conditions are limited to the areas in which the project would be implemented. That is, the proposed action would not have any indirect effects on fuels outside of the project area, and actions outside of the project area would not have any indirect effects on fuel conditions within the project area. Evaluating the project area allows for estimating the current and expected fuel loading, fuel models, and potential fire behavior. This scale shows the differences and trade-offs between alternatives to help to inform the decisionmaker.

Note that in the Fire Risk analysis (Issue 5), the BLM summarized effects to fire hazard as one of the components of fire risk. The Fire Risk analysis addresses the local scale, which includes the project area as well as structures and infrastructure within one-quarter mile of the project area. See the Fire Risk analysis.

The BLM also considered analyzing fire hazard at the sub-watershed scale, which is broader than the local scale. The sub-watershed is the sixth-field sub-watershed (also referred to as HUC12)

level. The project is located within the Walterville Canal sub-watershed, which is a smaller piece of the larger McKenzie River watershed. The sub-watershed encompasses a total 33,737 acres, of these acres BLM manages 2,904 acres or approximately 9 percent of the area. The 93-165 acres of proposed harvest and activity fuels treatments represents approximately 3-5 percent of BLM-administered lands in this sub-watershed. Across all ownerships in the sub-watershed, the proposed harvest represents approximately 0.3-0.5 percent of the landscape. Because the project affects less than one half of 1 percent of the sub-watershed, there would be no discernable differences in effects to fire hazard between the alternatives at this scale of analysis Therefore, this analysis does not analyze fire hazard at the sub-watershed scale.

Temporal scale:

This analysis evaluates fire hazard at three temporal scales:

- Short-term effects are 0 to 10 years post-harvest, which is based on the time it would take for activity-generated fine fuels (less than three inches diameter) to degrade (McIver and Ottmar 2007). Note that this analysis of short-term effects on fire hazard is also summarized as the hazard component in the Fire Risk analysis.
- Intermediate effects are 10 to 30 years, based on the changes in structural stage and their effects on fire hazard.
- Long-term effects are 30 to 50 years, which is the time it would take for fire hazard conditions post-harvest to approximate current conditions.

Affected Environment:

The current fire hazard category is High for the 89 acres in Young – High Density structural stage and Mixed for the 76 acres in Mature – Multi-layered Canopy structural stage[11] in the project area. The project area is dominated by Douglas-fir, with smaller components of western hemlock, western redcedar, and grand fir. Scattered hardwoods such as oak, bigleaf maple, golden chinkapin, madrone, and red alder exist. The dominant understory vegetation consists of salal, hazel, vine maple, Oregon grape, and swordfern. The project area is predominantly timber litter fuel types, with small pockets of timber understory fuel types (Standard Fire Behavior Fuel Models RMRS GTR-153). If a wildfire were to occur in the project area, predicted flame lengths would be 0-1 foot with a rate of spread of 0-2 chains per hour.[12] Crown fire activity would be classified as surface fire. The fuels specialist report (Gallimore 2020), which is incorporated here by reference, provides more detail on different components and measures of fire hazard.

Environmental Effects:

Alternative 1 – No Action

Under the No Action Alternative, trail construction, timber harvest, and reforestation activities would not occur on BLM-administered lands in the short term.

[11] Approximately one acre of these 76 acres is currently classified as Mature-Single-layered Canopy, which represents a fire hazard category of Low. Because of the small extent of this structural stage, it is combined with the acreage of Mature-Multi-layered Canopy for the purpose of this analysis.

[12] One chain equals 66 feet.

In the short term, stands would remain in the Young – High Density and Mature structural stages. Fuel loads would increase in the absence of timber harvest through the natural accumulation of needles, twigs, and limbs from self-pruning, stem breakage, and suppression mortality. However, this increase would not be enough to alter the overall fire hazard category in ten years. Therefore, the fire hazard in the short term would remain High in the 89 acres of Young – High Density stands and Mixed in the 76 acres of Mature stands.

In the intermediate timeframe at the project scale, it is reasonably foreseeable that the BLM would implement regeneration harvest in the project area (see Assumptions above). As a result, the stands at the project scale would change from Young – High Density stands and Mature stands to Early Successional stands, which represent a fire hazard category of Moderate, and then develop into Stand Establishment stands, which represent a fire hazard category of High. This change in fire hazard under the No Action alternative would be similar to the change described under all action alternatives but would happen 10 to 20 years later than under Alternatives 3, 4, and 5.

In the long term, stands at the project scale would develop into Young - High Density following regeneration harvest, with a fire hazard category of High. This change in fire hazard under the No Action alternative would be similar to the change described under all action alternatives but would happen 10 to 20 years later than under Alternatives 3, 4, and 5.

Alternative 2 – Trails Only

Under Alternative 2, the BLM would only construct trails at this time. The BLM would not implement timber harvest and reforestation activities in the short term. As in the No Action alternative, it is reasonably foreseeable that the BLM would implement regeneration harvest in the project area in the intermediate timeframe. As a result, the effect of Alternative 2 on fire hazard at the project scale at the short, intermediate, and long timeframes would be the same as the No Action alternative.

Alternative 3 – Trail Development and 165-Acre Regeneration Harvest

Under Alternative 3, the BLM would implement regeneration harvest on approximately 165 acres and construct trails. Following regeneration harvest, the BLM would reforest harvested areas with a minimum of 150 TPA, predominantly Douglas-fir with western hemlock and western redcedar. Regeneration harvest and subsequent reforestation would change the structural stage, fuel model, and fuel loadings within harvested areas.

In the short term, there would be an immediate and initial change in fire hazard, because timber harvest would create fuels and change the forest structural stage. On 89 acres, timber harvest would change the structural stage from Young – High Density to Early Successional, which represents an initial decrease in fire hazard from High to Moderate. On 76 acres, timber harvest would change the structural stage from Mature to Early Successional, which represents a change in fire hazard from Mixed to Moderate. (Mixed fire hazard indicates the potential to exhibit the full range of hazard categories from High to Low (FEIS, p. 254), which makes it difficult to characterize this initial change in hazard to Moderate as an increase or decrease). Timber harvest would increase the surface fuel loads within stands, as the stands would transition from a timber fuel models to slash fuel models, resulting in higher predicted flame lengths, fire duration, and intensity. This is consistent with the analysis in the FEIS (which is incorporated here by reference (FEIS, p. 265)), which found an increase in surface fuels has the potential to result in

higher rates of spread and greater flame lengths in the event of a wildfire, increasing the risk to firefighters and public safety. Predicted flame lengths would increase to 1-4 feet and rate for spread to 2-5 chains per hour. Crown fire activity would continue to be classified as surface fire. The fuels specialist report (Gallimore 2020), which is incorporated here by reference, provides more detail on changes to specific components and measures of fire hazard in response to timber harvest.

Fuel loading would be greatest during the first three years following harvest, when needles have dried but remain attached to tree limbs. Alternative 3 would include whole tree yarding on all harvested areas, and as a result, not every harvest acre would need additional slash disposal treatments. However, because of the values at risk (structures, transmission lines, etc.), the BLM would implement additional post-harvest activity fuels treatments. The BLM would conduct a fuels assessment within each unit following harvest activity. This assessment would determine the fire hazard based on surface fuel loading, aspect, slope, access, and location of each unit. Harvest areas where concentrations of increased fuel loadings remain after whole tree yarding would be piled and burned (Gallimore 2020). Slash disposal treatments would begin within 90 days after completion of harvest activities. Additionally, burning landing piles would occur 1 to 2 years post-harvest. Following slash disposal treatments, a reduction in potential fire behavior would occur due to the reduction in surface fuel loading and change in horizontal and vertical fuel arrangement. The overall increase in surface fuel loading and change in structural stage resulting from timber harvest would result in a fire hazard of Moderate initially after timber harvest.

Later in the short-term timeframe, following reforestation and stand growth, these stands would develop into the Stand Establishment structural stage, which represents a fire hazard category of High. Therefore, by the end of the short-term timeframe, all 165 acres of harvested stands would have a fire hazard of High. The development from the Early Successional to the Stand Establishment structural stage broadly represents a transition from a slash fuel type to a brush fuel type, which would occur approximately three to five years after reforestation. If a wildfire were to occur, stands with High fire hazard would exhibit high flame lengths, rates of spread, and fire intensity, and would be difficult to contain during weather conditions conducive to fire growth. This increase in fire hazard would be consistent with the analyses of the effect of timber harvest on fire hazard in the FEIS (pp. 253-270), which concluded and disclosed that regeneration harvest in the HLB will increase fire hazard in the short term. Those analyses are incorporated here by reference.

In the intermediate timeframe at the project scale, stands at the project scale would develop from Stand Establishment into Young - High Density. Both the Stand Establishment and Young structural stages represent a fire hazard category of High, so the fire hazard category would not change during this timeframe.

In the long-term timeframe, stands at the project scale would develop into the Mature-Multi-layered Canopy structural stage, which represent a fire category of Mixed. As noted above, Mixed fire hazard indicates the potential to exhibit the full range of hazard categories from High to Low (FEIS, p. 254), which makes it difficult to characterize this long-term change in hazard from High to Mixed as an increase or decrease.

Preferred Alternative 4 –Trail Development and 109-Acre Regeneration Harvest

Under Alternative 4, the BLM would implement regeneration harvest on 109 acres and construct trails. Following regeneration harvest, the BLM would reforest harvested areas with a minimum of 150 TPA, predominantly Douglas-fir with western hemlock and western redcedar. Regeneration harvest and subsequent reforestation would change the structural stage, fuel model, and fuel loadings within harvested areas.

In the short term, there would be an immediate and initial change in fire hazard, because timber harvest would create fuels and change the forest structural stage, but on a smaller acreage than Alternatives 3 and 5. On 36 acres, timber harvest would change the structural stage from Young – High Density to Early Successional, which represents an initial decrease in fire hazard from High to Moderate. On 73 acres, timber harvest would change the structural stage from Mature to Early Successional, which represents a change in fire hazard from Mixed to Moderate. The overall increase in surface fuel loading and change in structural stage resulting from timber harvest would result in a fire hazard of Moderate initially after timber harvest. Later in the short-term timeframe, following reforestation and stand growth, these stands would develop into the Stand Establishment structural stage, which represents a fire hazard category of High. Therefore, by the end of the short-term timeframe, all 109 acres of harvested stands would have a fire hazard of High. On these 109 acres that would be harvested, the changes in fire hazard would be the same as Alternatives 3 and 5. On the 56 acres that would not be harvested at this time, the effects of Alternative 4 would be the same as the No Action alternative: the fire hazard in the short term would remain High in the 54 acres of Young – High Density stands and Mixed in the 2 acres of Mature stands.

In the intermediate timeframe at the project scale, the 109 acres harvested under this proposed action would develop from Stand Establishment into Young - High Density following regeneration harvest and reforestation. Both the Stand Establishment and Young structural stages represent a fire hazard category of High, so the fire hazard category would not change during this timeframe on the 93 acres that would be harvested under this proposed action. On the 56 acres that would not be harvested under this proposed action, it is reasonably foreseeable that the BLM would implement regeneration harvest in the project area, similar to the No Action alternative. As a result, the stands at the project scale that would not be harvested under the proposed action would change to Early Successional stands in the intermediate timeframe, which represent a fire hazard category of Moderate, and then develop into Stand Establishment stands, which represent a fire hazard category of High. Therefore, under Alternative 4, all 165 acres would have a fire hazard category of High by the end of the intermediate timeframe.

In the long-term timeframe, the 109 acres that were harvested under this proposed action would develop into the Mature-Multi-layered Canopy structural stage, which represent a fire category of Mixed, similar to Alternatives 3 and 5. On the 56 acres that would not be harvested under this proposed action, stands would develop into Young - High Density following regeneration harvest, with a fire hazard category of High, similar to the No Action alternative.

Alternative 5 – 165-Acre Regeneration Harvest Only

Under Alternative 5, the BLM would implement regeneration harvest on approximately 165 acres. Following regeneration harvest, the BLM would reforest harvested areas with a minimum of 150 TPA, predominantly Douglas-fir with western hemlock and western redcedar. Regeneration harvest and subsequent reforestation would change the structural stage, fuel model,

and fuel loadings within harvested areas. Under Alternative 5, the BLM would not construct trails.

Because the timber harvest under Alternative 5 would be the same as Alternative 3, the effect of Alternative 5 on fire hazard at the project scale would be the same as Alternative 3 for the short, intermediate, and long timeframes.

Summary

Under Alternatives 3, 4, and 5, timber harvest would increase fire hazard in the short-term at the project scale because of the creation of residual activity fuels. The use of whole tree yarding and slash treatments would reduce, but not eliminate, this increase in fire hazard. Subsequent reforestation would create stands that would have a Moderate fire hazard initially, followed by a High fire hazard by the end of the short term and during the intermediate timeframe, followed by a Mixed fire hazard in the long term. Because regeneration harvest is reasonably foreseeable in the intermediate timeframe under the No Action alternative, Alternative 2, and the unharvested portions of the project area under Alternative 4, the same effects on fire hazard would occur under these alternatives, except 10 to 20 years later. Therefore, the effects on fire hazard would be the same under all alternatives, although the timing of these effects would differ.

4.0 Consultation

BLM actions achieve compliance with the Endangered Species Act (ESA) through informal and formal Section 7 consultation with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). Relative to ESA listed fish, the BLM fisheries biologist determined that all project areas would be over two miles away from Upper Willamette River Chinook salmon critical habitat and bull trout critical habitat and that the proposed actions would not change habitat conditions, including large woody debris, sediment delivery, water temperature, or connectivity. The project would therefore have no effect on these species or their critical habitat; therefore the BLM did not consult with USFWS and the NMFS.

Relative to ESA-listed wildlife, the BLM completed consultation with the USFWS for the Thurston Hills project in fall of 2017 (U.S. Fish and Wildlife Service, 2017) on potential effects to the northern spotted owl. While there are no known spotted own sites in the project area, the consultation determined that the Thurston Hills project would be "Likely to Adversely Affect" spotted owls through habitat modification, "Not Likely to Adversely Affect" spotted owls through noise disruption, and would have "No Effect" to spotted owl critical habitat. The consultation did not call for the BLM to implement or avoid specific project actions. The BLM did not identify any other ESA-listed wildlife species or their habitats in the project area.

5.0 List of Preparers

Name (BLM unless noted)	Title	Contributions
Wade Judy	Outdoor Recreation Planner	Team Co-Lead, Recreation, Visual Resources
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Jessica LeRoy	Engineer	Roads, Culverts
Zach Jarrett	Outdoor Recreation Planner	Trail Planning and Design
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Emily Erickson	Botanist	Botany
Terry Godin	Archaeologist	Cultural resources
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Jessica Gallimore	Fuels Specialist	Fuels Management, Fire Hazard, Fire Risk
Jennifer Puttere	Soils Specialist	Soils
Andy Hamilton	Hydrologist	Hydrology, Sediment Yield, Stream flows
Damian Hayes	Law Enforcement Officer	Safety

GLOSSARY

Activity fuel – Wild fire fuels resulting from, or altered by, forestry practices such as timber harvest or thinning, as opposed to naturally created fuels. Also, logging debris: unwanted tree parts (crowns, logs, uprooted stumps) remaining after harvest).

Basal area - the cross sectional area of a single tree stem, including the bark, measured at breast height (4.5 ft.) above the ground. Basal Area in this EA is described in square feet and includes all conifers ≥ 8" DBH. If not specified, BA in table headings implies square feet per acre.

Baseline - The starting point for Analysis of Environmental Consequences; may be the conditions at a point in time (e.g., when inventory data is collected) or may be the average of a set of data collected over a specified period of years

Broadcast Burn - Allowing a prescribed fire to burn over a designated area within well-defined boundaries for reduction of fuel hazard or as a silvicultural treatment, or both.

Canopy Cover – Proportion of the forest floor covered by the vertical projection of tree crowns.

Cumulative Effect - The impact that results from identified actions when they are added to other past, present, and reasonably foreseeable future actions regardless of who undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Diameter at Breast Height (DBH) - The diameter of a tree 4.5 feet above the ground on the uphill side of the tree.

Endangered Species - Any species defined through the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range and published in the Federal Register.

Environmental Assessment (EA) - A systematic analysis of site-specific BLM activities used to determine whether such activities have a significant effect on the quality of the human environment; and whether a formal Environmental Impact Statement is required; and to aid an agency's compliance with NEPA when no EIS is necessary.

Environmental Impact - The positive or negative effect of any action upon a given area or resource.

Environmental Impact Statement (EIS) - A formal document to be filed with the Environmental Protection Agency that considers significant environmental impacts expected from implementation of a major Federal action.

Extensive Recreation Management Area (ERMA) – An administrative unit that requires specific management consideration in order to address recreation use, demand, or Recreation and Visitor Services (R and VS) program investments.

Forest Canopy - The cover of branches and foliage formed collectively by the crowns of adjacent trees and other woody growth.

Forest Succession - The orderly process of change in a forest as one plant community or stand condition is replaced by another, evolving towards the climax type of vegetation.

Fuel Model- A stylized set of fuelbed inputs need by a particular fire behavior or fire effects model. This analysis utilized the Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model

Green Tree Retention - A stand management practice in which live trees as well as snags and large down wood, are left as biological legacies within harvest units to provide habitat components over the next management cycle.

Landing - Any place on or adjacent to the logging site where logs are assembled for further transport.

Land Use Allocations - Allocations that define allowable uses/activities, restricted uses/ activities, and prohibited uses/activities. They may be expressed in terms of area such as acres or miles, etc. Each allocation is associated with a specific management objective.

LANDFIRE (LF) - Landscape Fire and Resource Management Planning Tools, is a shared program between the wildland fire management programs of the U.S. Department of Agriculture Forest Service and U.S. Department of the Interior, providing landscape scale geo-spatial products to support cross-boundary planning, management, and operations. LANDFIRE (LF) delivers 20+ geospatial data products on vegetation, fuel, disturbance, and fire regimes for the entire nation. Methods are based on peer-reviewed science from multiple fields. LF products are consistent, comprehensive, and standardized.

Pond Value – The amount a mill will pay for a log delivered to the mill location.

Prescribed Fire - A fire burning under specified conditions that will accomplish certain planned objectives.

Recreation Management Zone (RMZ) – A subdivision of a recreation management area that further delineates specific recreation opportunities and/or recreation setting characteristics.

Reforestation - The natural or artificial restocking of an area with forest trees; most commonly used in reference to artificial stocking.

Regeneration Harvest - Timber harvest conducted with the partial objective of opening a forest stand to the point where favored tree species will be reestablished.

Resource Management Plan (RMP) - A land use plan prepared by the BLM under current regulations in accordance with the Federal Land Policy and Management Act.

Site Preparation - Any action taken in conjunction with a reforestation effort (natural or artificial) to create an environment that is favorable for survival of suitable trees during the first growing season. This environment can be created by altering ground cover, soil, or microsite conditions, using biological, mechanical, or manual clearing, prescribed burns, herbicides, or a combination of methods.

Skid Trail - A pathway created by dragging logs to a landing (gathering point).

Slash - The branches, bark, tops, cull logs, and broken or uprooted trees left on the ground after logging.

Snag - Any standing dead, partially-dead, or defective (cull) tree at least 10 inches in diameter at breast height (DBH) and at least 6 feet tall. A hard snag is composed primarily of sound wood,

generally merchantable. A soft snag is composed primarily of wood in advanced stages of decay and deterioration, generally not merchantable.

Soil Compaction - An increase in bulk density (weight per unit volume) and a decrease in soil porosity resulting from applied loads, vibration, or pressure.

Soil Displacement - The removal and horizontal movement of soil from one place to another by mechanical forces such as a blade.

Soil Productivity - Capacity or suitability of a soil for establishment and growth of a specified crop or plant species, primarily through nutrient availability.

Stand (Tree Stand) - An aggregation of trees occupying a specific area and sufficiently uniform in composition, age, arrangement, and condition so that it is distinguishable from the forest in adjoining areas.

Stand Density - An expression of the number and size of trees on a forest site. May be expressed in terms of numbers of trees per acre, basal area, stand density index, or relative density index.

Sustained Yield - The yield that a forest can produce continuously at a given intensity of management.

Yarding - The act or process of moving logs to a landing.

Wildfire Hazard - the ease of ignition, potential fire behavior, and resistance to control of the fuel complex, defined by the volume and arrangement of several strata, including surface, ladder, and canopy fuels (Calkin et al. 2010).

Wildfire Hazard Potential (WHP): A geospatial map product produced by the U.S. Forest Service Fire Modeling Institute; shows data to inform evaluations of wildfire risk or prioritization of fuels management across very large landscapes (millions of acres). Model depicts the relative probability of experiencing extreme fire behavior with torching and crowning, and the potential for wildfire that would be difficult for suppression resources to contain during weather conditions favorable for fire growth.

Wildfire Risk - risk is the potential for realization of adverse or beneficial consequences to highly valued resources and assets. In terms of wildfire, an assessment of risk evaluates the interaction of wildfire hazard (likelihood and intensity), exposure (susceptibility) and effects on those values (e.g where people live, timber resources, habitat, etc.). There is no single best measure or way to evaluate risk.

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APPENDIX A – SEE ATTACHED MAP PACKET

BMP No. (if from RMP)	**APPENDIX B - Project PDFs** **Site-specific waivers or modifications of PDFs during project implementation would require approval by the Authorized Officer and review by BLM specialists for the affected resource(s) to determine that the waiver or modification would not in itself, or combined with other waivers/modifications, produce effects outside of those analyzed in this EA.**
Cultural Resources	
	If any cultural and/or paleontological resource (historic or prehistoric site or object) is discovered during project activities, all operations in the immediate area of such discovery shall be suspended until an evaluation of the discovery can be made by a professional archaeologist to determine appropriate actions to prevent the loss of significant cultural or scientific values.
Roads	
R 01	Locate temporary and permanent roads, trails, and landings on stable locations, e.g., ridge tops, stable benches, or flats, and gentle-to-moderate side slopes. Minimize road construction on steep slopes (> 60 percent).
R 02	Locate temporary and permanent road and/or trail construction or improvement to minimize the number of stream crossings.
R 03	Locate roads and landings away from wetlands, Riparian Reserve, floodplains, and waters of the State, unless there is no practicable alternative. Avoid locating landings in areas that contribute runoff to channels.
R 04	Locate roads and landings to reduce total transportation system mileage. Renovate or improve existing roads or landings when it would cause less adverse environmental impact than new construction. Where roads traverse land in another ownership, investigate options for using those roads before constructing new roads.
R05	Design roads to the minimum width needed for the intended use as referenced in BLM Manual 9113 – 1 – Roads Design Handbook (USDI BLM 2011).
R 26	Disconnect road runoff to the stream channel by outsloping the road approach. If outsloping is not practicable, use runoff control, erosion control and sediment containment measures. These may include using additional cross drain culverts, ditch lining, and catchment basins. Prevent or reduce ditch flow conveyance to the stream through cross drain placement above the stream crossing.
R 30	Effectively drain the road surface by using crowning, insloping or outsloping, grade reversals (rolling dips), and waterbars or a combination of these methods. Avoid concentrated discharge onto fill slopes unless the fill slopes are stable and erosion-resistant
	Shape all landings to direct surface water away from water features and onto well-vegetated forest floor
R 35	Install underdrain structures when roads cross or expose springs, seeps, or wet areas rather than allowing intercepted water to flow down-gradient in ditchlines.
R 36	Design roads crossing low-lying areas so that water does not pond on the upslope side of the road. Provide cross drains at short intervals to ensure free drainage.

R 39	Locate cross drains to prevent or minimize runoff and sediment conveyance to waters of the State. Implement sediment reduction techniques such as settling basins, brush filters, sediment fences, and check dams to prevent or minimize sediment conveyance. Locate cross drains to route ditch flow onto vegetated and undisturbed slopes.
R 46	Skew cross drain culverts 45–60 degrees from the ditchline and provide pipe gradient slightly greater than ditch gradient to reduce erosion at cross drain inlet
R 85	Post-harvest, convert existing drainage structures (such as ditches and cross drain culverts on Spur D) to a long-term maintenance free drainage configuration such as an outsloped road surface and waterbars
R 91	Post-harvest, implement tillage measures, including ripping or subsoiling to an effective depth and leadouts as necessary to prevent channeling on Spur D. Treat compacted areas including the roadbed, landings, construction areas, and spoils sites
R93	On active haul roads, during the wet season, use durable rock surfacing and sufficient rock depth to resist rutting or development of sediment on road surfaces that drain directly to wetlands, floodplains, and waters of the State
	Optional Landing Spurs will not exceed an aggregated total of 0.1 miles of new construction. Spurs and landings will provide for proper drainage and erosion control by following road construction BMPs. Spurs will be waterbarred and blocked following use.
Hydrology	
Management Direction (RMP p. 79)	Design culverts, bridges, and other stream crossings for a 100-year flood event, including allowance for bed load and anticipated floatable debris
Management Direction (RMP p. 80)	Suspend commercial road use where the road surface is deteriorating due to vehicular rutting or standing water, or where turbid runoff is likely to reach stream channels.
Timber Harvest	
TH 06	Implement erosion control measures such as waterbars, slash placement, and seeding in cable yarding corridors where the potential for erosion and delivery to waterbodies, floodplains, and wetlands exists.
TH 07	Exclude ground-based equipment on hydric soils, defined by the Natural Resources Conservation Service
Management Direction (RMP pp. 89-90)	Detrimental soil disturbance from forest management operations will stay under 20% of the harvest unit area. When the combined detrimental soil disturbance from implementation of forest management operations and detrimental soil disturbance from past management operations exceed 20% of the unit area, mitigation will be applied to reduce total detrimental soil disturbance to less than 20% of the total unit area.
	Where possible, place cable corridors to avoid snags and down woody material. If snags are felled, leave them on site as down woody material; they may be cut into sections and moved to facilitate operations or safety. Attempt to maintain segments at least 20 foot long for any cut and moved CWD.

TH 08	Limit designated skid trails for thinning or regeneration harvesting to ≤ 15 percent of the harvest unit area to reduce displacement or compaction to acceptable limits.
TH 09	Limit width of skid roads to single width or what is operationally necessary for the approved equipment. Where multiple machines are used, provide a minimum-sized pullout for passing.
TH 10	Ensure leading-end of log is suspended when skidding.
TH 11	Restrict non-road, in unit, ground-based equipment used for harvesting operations to periods of low soil moisture; generally from May 15 to Oct 15. Low soil moisture varies by texture and is based on site-specific considerations. Low soil moisture limits will be determined by qualified specialists to determine an estimated soil moisture and soil texture.
TH 12	Incorporate existing skid trails and landings as a priority over creating new trails and landings where feasible, into a designated trail network for ground-based harvesting equipment, consider proper spacing, skid trail direction and location relative to terrain and stream channel features.
TH 14	Limit the use of specialized ground-based mechanized equipment (those machines specifically designed to operate on slopes greater than 35 percent) to slopes less than 50 percent, except when using previously constructed trails or accessing isolated ground-based harvesting areas requiring short trails over steeper pitches. Also, limit the use of this equipment when surface displacement creates trenches, depressions, excessive removal of organic horizons, or when disturbance would channel water and sediment as overland flow.
TH 15	Designate skid trails in locations that channel water from the trail surface away from waterbodies, floodplains, and wetlands, or unstable areas adjacent to them.
TH 16	Apply erosion control measures to skid trails and other disturbed areas with potential for erosion and subsequent sediment delivery to waterbodies, floodplains, or wetlands. These practices may include seeding, mulching, water barring, tillage, and woody debris placement. Use guidelines from the road decommissioning section.
TH 17	Construct waterbars on skid trails using guidelines in Table C-6 [RMP p.161, Erosion Hazard Ratings], where potential for soil erosion or delivery to waterbodies, floodplains, and wetlands exists.
TH 18	Subsoil skid trails, landings, or temporary roads where needed to achieve no more than 20 percent detrimental soil conditions, and minimize surface runoff, improve soil structure, and water movement through the roadbed.
TH 19	Block skid trails to prevent public motorized vehicle and other unauthorized use at the end of seasonal use.
Wildlife, Plants, and Fisheries	
	BLM may stop project operations if threatened or endangered species, BLM Sensitive species, or raptors may be adversely affected. [Stipulation E-6]
	Prior to entry to the site, all logging and construction equipment to be used off of roads and any roadside brushing equipment would be cleaned of dirt, grease, vegetation or any other material that may spread invasive/non-native plants or vegetative material onto BLM lands. Cleaned equipment would be inspected by the BLM at an agreed upon location prior to entering BLM lands.

	All cut trees (≥ 6" diameter at breast height [DBH]) within the Riparian Reserve (if cut for the purpose of trail-building) would be left on site as downed woody debris or converted to bridges for trail/stream crossings.
	Any leaking equipment would be repaired or removed immediately if requested by the Authorized Officer (AO).
Trails	
REC 01	Implement erosion control measures at recreation sites to stabilize exposed soils where water flows or sediment, may reach waterbodies.
REC 27	When constructing or maintaining trails within Riparian Reserve, do not cut any portion of logs or coarse woody debris (≥ 6" diameter at breast height [DBH]) and ≥ 20 feet long) that extend into the active stream channel. Use alternative passage options, such as earthen ramps, small notch steps, or slight trail realignments, to facilitate maintenance of intact logs. Cut and stabilize if necessary for safe passage and safety.
	Create sidehill trails where possible to minimize tread erosion, muddiness, widening, and secondary treads
	When possible, avoid trail placement in soils that remain wet for long periods of time. When wet soils need to be traversed for short stretches: use stone pitching; construct parallel drainage ditches to drain water from treads; use elevated wooden walkways or other similar solution to elevate the trail above wet ground. If using an earthen turnpike, amend soil with 3/4"-crushed rock.
	Trail construction in hydric soils will utilize armoring methods where needed per the following specifications. Layer, from the bottom up: base layer of ballast-size (4"-6") angular rock; layer of 3" crushed rock; a final cap of 3/4" crushed rock mixed with native soils at an approximate 30/70 ratio. The final cap should be elevated above the surrounding terrain.
	All trail stream crossings will be constructed with a bridge that spans the bankfull channel plus 30% and has lead-outs or rolling grade change such that water is directed off the trail surface at least 50 feet from the crossing and constructed with ascending trail grade to bridge ends
	Construct turns with grade reversal just uphill of turns to ensure water drains from trail preceding switchback in a downslope direction.
	Coarse Woody Debris: During trail construction, protect and retain coarse woody debris (measuring ≥ 6" DBH and ≥ 20 feet long) on the ground wherever possible. If woody debris must be moved, the section of log within the trail's path will be cut and removed instead of moving the entire log
	Avoid the construction of new trails on shallow soils (soil depth less than 20 inches) and seasonally shallow water tables except where trail is over rock. If new trails are proposed on shallow or very fine textured soils, surfacing such as crushed rock or boardwalks must be used to prevent soil degradation, muddiness, and erosion.

	Slope the trail tread to either drain water or to resist user forces. If insloping is used it must be combined with a drainage basin off the trail at the low point
	Suspend construction or maintenance of trails when erosion and runoff would likely be delivered to water bodies.
	Trail grade shall typically not exceed half the grade of the hillside. Exceptions can occur on trails located on spur roads (constructed for harvest) and on trails for descending-direction cyclists that have 1) proper flow to minimize braking, 2) regular grade reversals and other water control mechanisms, 3) good canopy, and 4) armoring, or some combination thereof.
	Design, construct, and maintain appropriately placed trail inslopes with small drainage basins, outslopes, and frequent grade reversals at intervals no longer than 50 feet tip to tip. Grade reversals should vary randomly and take advantage of natural variation in terrain to regularly drain the trail tread.
	Use drainage feature spacing intervals on trails according to slope grades, as follows: on 3-5% slopes - every 500 feet; 7-10% slopes -- every 300 feet; 11-15% slopes -- every 100 feet; >15% slopes -- every 50 feet or less.
	Post-harvest roads to be converted to trails will first be shaped/structured as trail, after which the remaining road bed outside the trail will be decompacted and sowed with native grass seed and/or weed-free mulch.
	Any hand or mechanized equipment coming onto the site for trail construction or maintenance shall be cleaned before arrival.

APPENDIX C -- TABLE OF ROAD CONSTRUCTION AND DRAINAGE CULVERTS ASSOCIATED WITH PEDAL POWER TIMBER SALE, BY ALTERNATIVE

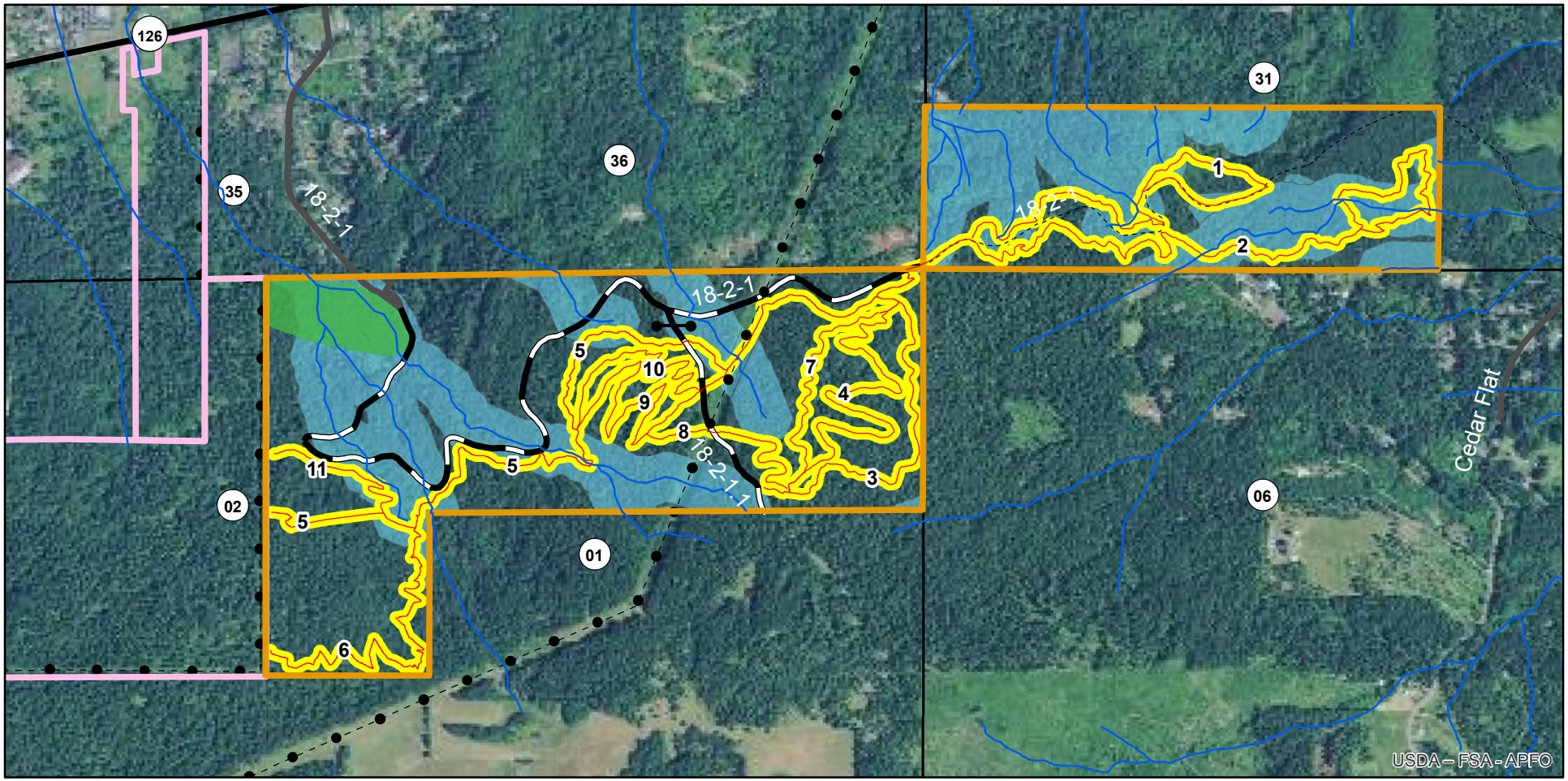
Road Segment	Proposed Work	Length (Miles)	Proposed Surface	Maximum No. Culverts		Post-Harvest Road Disposition
				Cross-Drain Installations	Stream Crossings *	
ALTERNATIVE 3						
18-2-1 (Sect 1)	Renovation	2.25	Rock	8	4	Open
18-2-1 (Sect 31)	Renovation	0.82	Rock	6		Gate/Waterbar**
18-2-1.1	Renovation	0.33	Rock	2		Gate**
Spur A	Construction	0.22	Rock	3	1	Block**
Spur C	Construction	0.04	Rock	1		Block
Spur D	Renovation	0.47	Native	5		Block/Waterbar**
Spur E	Construction	0.09	Rock	1		Open
Spur E-1	Construction	0.06	Rock	1		Open
Optional Landing Spurs	Construction	0.06	Optional	1		Block/Waterbar
ALTERNATIVE 4						

18-2-1 (Sect 1)	Renovation	2.25	Rock	8	4	Open
18-2-1 (Sect 31)	Renovation	0.82	Rock	6		Gate/Waterbar**
18-2-1.1	Renovation	0.33	Rock	2		Gate**
Spur A	Construction	0.22	Rock	3	1	Block**
Spur C	Construction	0.04	Rock	1		Block
Spur E	Construction	0.09	Rock	1		Open
Spur E-1	Construction	0.06	Rock	1		Open
Optional Landing Spurs	Construction	0.06	Optional	1		Block/Waterbar
ALTERNATIVE 5						
18-2-1 (Sect 1)	Renovation	2.25	Rock	8	4	Open
18-2-1 (Sect 31)	Renovation	0.82	Rock	6		Block/Waterbar
18-2-1.1	Renovation	0.33	Rock	2		Open or Block
Spur A	Construction	0.22	Rock	3	1	Block
Spur C	Construction	0.04	Rock	1		Block
Spur D	Renovation	0.47	Native	5		Block/Waterbar
Spur E	Construction	0.09	Rock	1		Open
Spur E-1	Construction	0.06	Rock	1		Open
Optional Landing Spurs	Construction	0.06	Optional	1		Block/Waterbar

* Proposed culverts at stream crossings would be replacements unless road is new
** Road segment to be converted to trail after timber harvest (no decommissioning as part of timber harvest)

Construction - building a new road, including activities such as tree cutting and brush clearing within the road prism, grading, installing drainage structures, and applying rock. New rock construction would apply up to approximately 14 inches (depth) of rock, including subgrade and surface rock.

Renovation - bringing an existing road back to original design standard. Rock renovations would involve adding rock, with the amount varying on the condition of the road; renovations to native surface would not apply rock. Renovations may also include, but not be limited to, clearing brush within the road prism, cleaning or replacing ditch relief/stream crossing culverts, restoring road surface drainage, and grading.



Project Area
Willamalane Park & Recreation District
Late-Successional Reserve
Riparian Reserve
Recreation Management Zone (RMZ) and Designated Trails

Paved Road
Rocked Road
Legacy Road
Stream
Power Line

1 Trail Segment Number
1 Section Number
Gate

N

Alternative 2 - Trails Only

0 0.25 0.5 Miles

THURSTON HILLS NON-MOTORIZED TRAILS AND FOREST MANAGEMENT PROJECT

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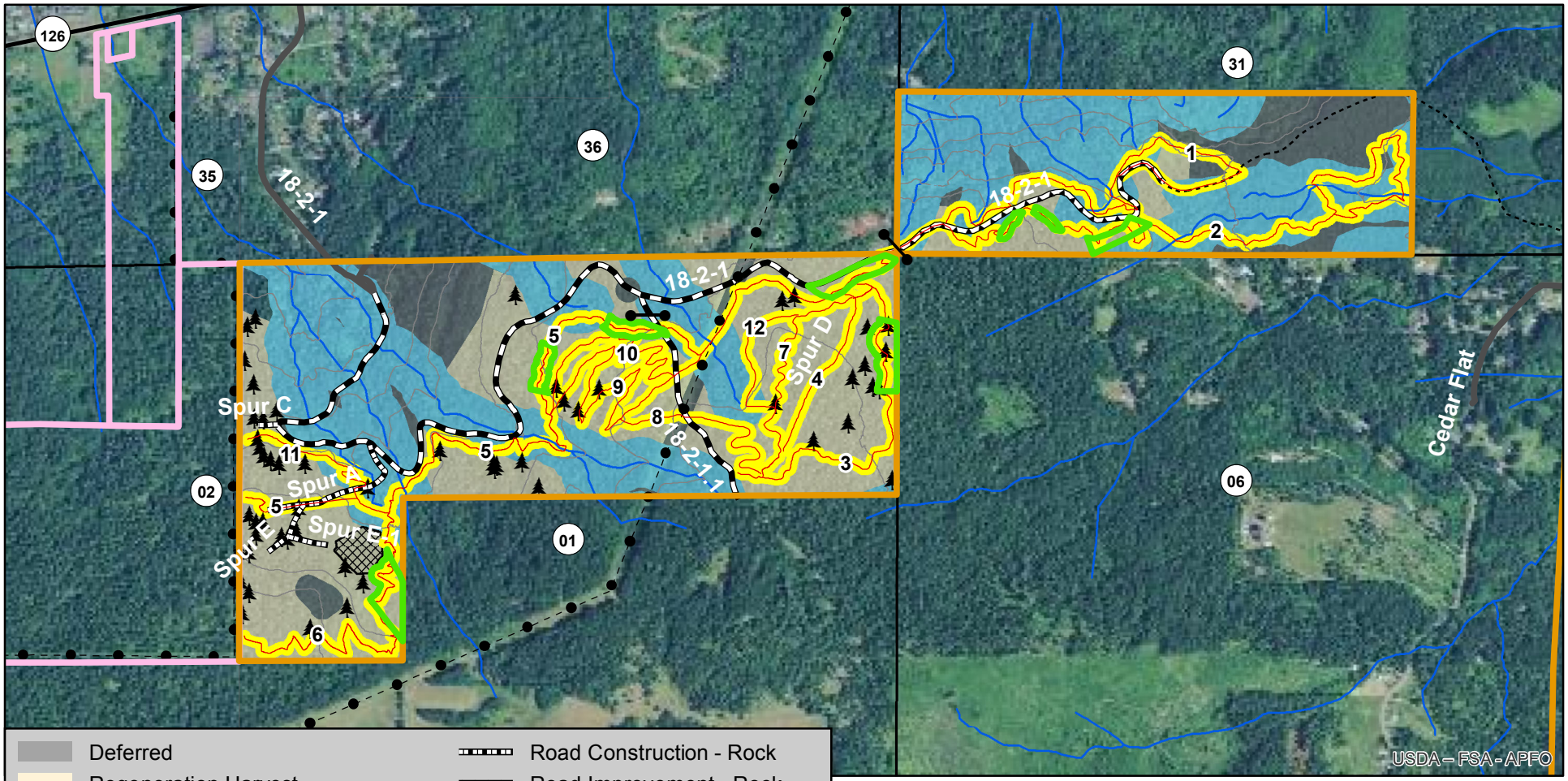


Deferred
Regeneration Harvest
Riparian Reserve
Cable Yarding Only
Aggregate Green Tree Retention
Project Area
Willamalane Park & Recreation District
Recreation Management Zone (RMZ) and Designated Trails
Stream

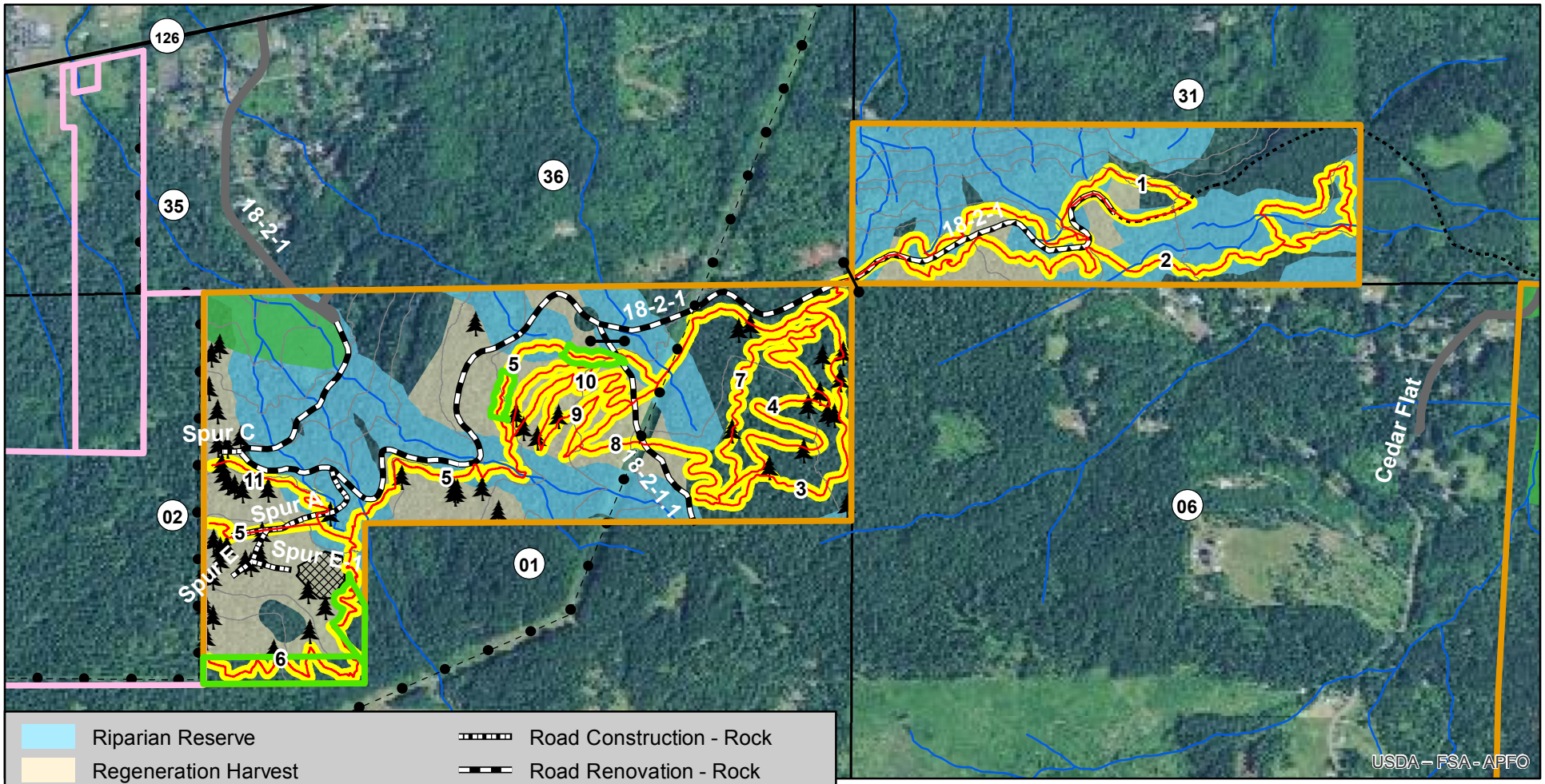
Road Construction - Rock
Road Improvement - Rock
Road Renovation - Rock
Paved Road
Legacy Road (Non-Driveable)
Power Line
Approximate Location of Wildlife Tree
Trail Segment Number
Section Number
Gate

Alternative 3 - 165 Acre Regeneration Harvest and Trails

N

0 0.25 0.5 Miles

THURSTON HILLS NON-MOTORIZED TRAILS AND FOREST MANAGEMENT PROJECT



Riparian Reserve
Regeneration Harvest
Cable Yarding Only
Project Area
Late-Successional Reserve
Aggregate Green Tree Retention
Willamalane Park & Recreation District
Recreation Management Zone (RMZ) and Designated Trails
Streams

Road Construction - Rock
Road Renovation - Rock
Paved Road
Road Improvement - Rock
Legacy Road (Non-Driveable)
Power Line
Approximate Location of Wildlife Tree
Trail Segment Number
Section Number
Gate

Preferred Alternative 4 - 109 Acre Regeneration Harvest and Trails

N

0 0.25 0.5 Miles

THURSTON HILLS NON-MOTORIZED TRAILS AND FOREST MANAGEMENT PROJECT

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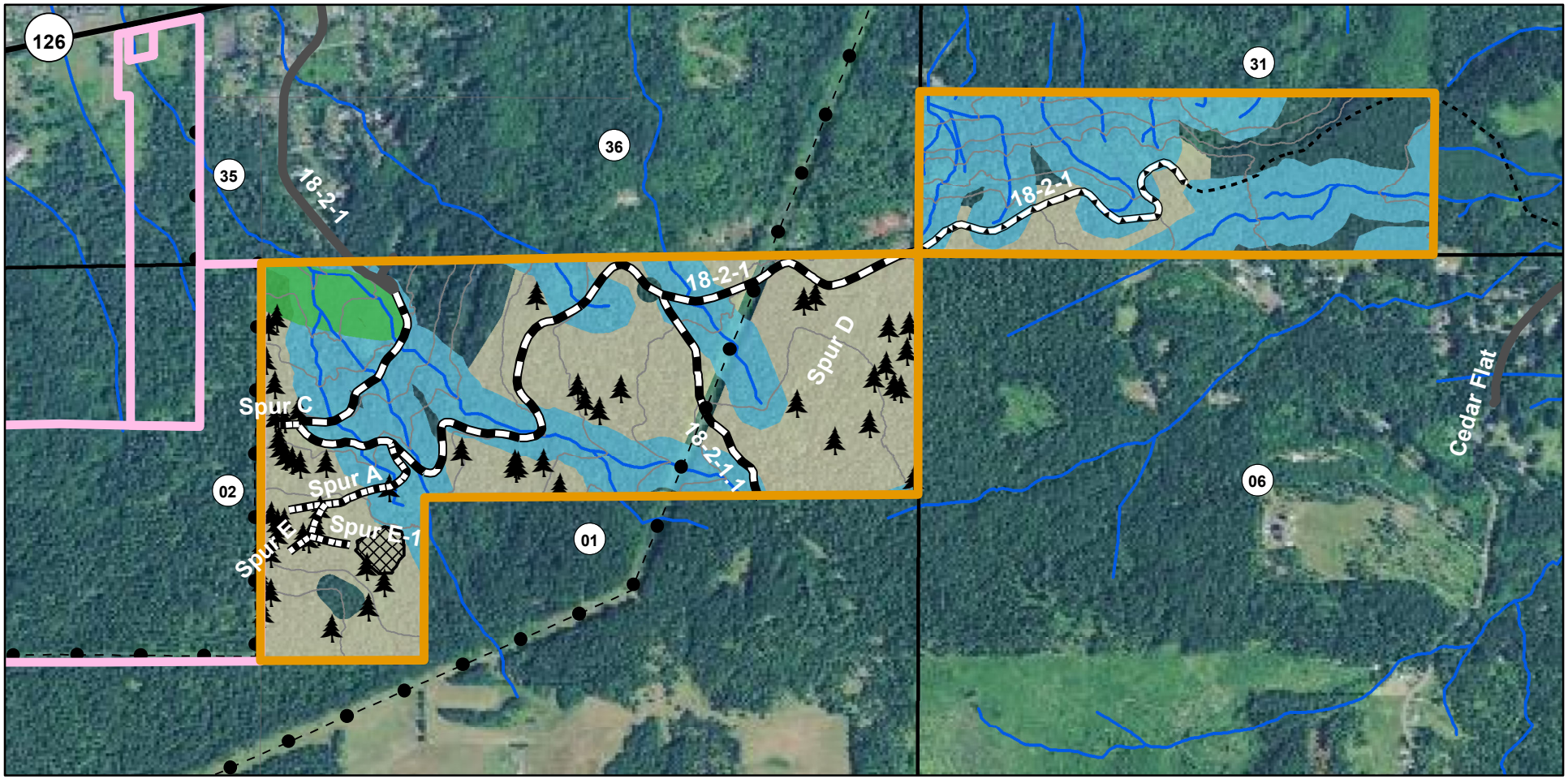

- Regeneration Harvest
- Riparian Reserve
- Cable Yarding Only
- Project Area
- Willamalane Park & Recreation District
- Late-Successional Reserve
- Stream
- Road Construction - Rock
- Road Improvement - Rock
- Road Renovation - Rock
- Paved Road
- Legacy Road (Non-Driveable)
- Power Line
- Approximate Location of Wildlife Tree
- 1 Section Number

Alternative 5-
165 Acre Regeneration Harvest Only

N

0 0.25 0.5 Miles

THURSTON HILLS NON-MOTORIZED TRAILS AND FOREST MANAGEMENT PROJECT

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
NORTHWEST OREGON DISTRICT OFFICE

FINDING OF NO SIGNIFICANT IMPACT

DOI-BLM-ORWA-N050-2017-0006-EA

The Bureau of Land Management (BLM) has prepared a revised Thurston Hills Non-Motorized Trails and Forest Management Project Environmental Assessment (EA) (DOI-BLM-ORWA-N050-2017-0006-EA) (February 2020 EA) that analyzed the effects of two separate actions presented for analysis by the Upper Willamette Field Office, Northwest Oregon District Bureau of Land Management (BLM): 1) a regeneration timber harvest, named the Pedal Power Timber Sale; and 2) designate and develop a new non-motorized trail system for hiking and mountain biking. The BLM analyzed a No Action Alternative and five action alternatives in the EA.

The BLM prepared an Environmental Assessment (EA) for this proposed action in April 2018. The BLM prepared a Finding of No Significant Impact (FONSI) for Alternative 3 on May 30, 2018, which included a regeneration harvest action followed by a trail development action. The BLM subsequently decided to implement a modification of Alternative 4 (Modified Alternative 4), which implemented a) a regeneration harvest with approximately 15 percent green tree retention rather than 10 percent, resulting in a 100-acre regeneration harvest, and b) a trail development action unchanged from Alternative 4 in the EA. The BLM prepared a Determination of NEPA Adequacy (DNA) for the Modified Alternative 4 (DOI-BLM-ORWA-N050-2018-0016-DNA, DNA) and found that this proposal conformed to the applicable land use plan and that the existing National Environmental Policy Act (NEPA) documentation fully covered the proposed actions and constituted BLM's compliance with the requirements of the NEPA. In September 2018, the Pedal Power Timber Sale was offered for sale and purchased by Seneca Sawmill. Road work for Modified Alternative 4 was completed in spring 2019.

In response to a September 18, 2019, opinion and order from the U.S. District Court for the District of Oregon (*Cascadia Wildlands and Oregon Wild v. Bureau of Land Mgmt.*, Case. No. 6:19-cv-00247-MC), the BLM is issuing this February 2020 EA to disclose the potential increase of fire hazard to adjacent communities, designate trails, and designate and preserve a Recreation Management Zone (RMZ) prior to timber harvest.

The analysis in this EA is site-specific and supplements and tiers to the analyses found in the *Proposed Resource Management Plan/Final Environmental Impact Statement for Western Oregon*, March 2016 (PRMP/FEIS). The proposed activities have been designed to conform to the *Northwestern and Coastal Oregon Record of Decision and Resource Management Plan*, August 2016 (ROD/RMP) and related documents, which direct and provide the legal framework for management of BLM lands within the Northwest Oregon District (EA Section 1.3).

On the basis of the information contained in the February 2020 EA, the Thurston Hills Interdisciplinary Team Specialists' Reports, and all other information available to me, it is my determination that none of the project alternatives would have a significant effect on the quality of the human environments (40 C.F.R. § 1508.27). Therefore, an environmental impact

statement (EIS) is not necessary and will not be prepared. This finding is based on my consideration of the Council on Environmental Quality's (CEQ) criteria for significance (40 C.F.R. § 1508.27), about the context and to the intensity of the impacts described in the February 2020 EA

Finding of No Significant Impact (FONSI)

The FONSI is defined in 40 C.F.R. § 1508.13 as a document briefly presenting the reasons why an action will not have a significant effect on the human environment which includes the natural and physical environment and the relationship of people with that environment. If the agency finds that the proposed action has no significant impact, the agency is not required to prepare an EIS for the project. The CEQ regulations define the factors to consider in determining whether a project is anticipated to "significantly" impact the human environment (40 C.F.R. § 1508.27). This FONSI documents the BLM's evaluation of the potential impacts of the revised Thurston Hills Non-Motorized Trails and Forest Management Project under all the action alternatives analyzed in the February 2020 EA. Based upon review of the February 2020 EA and supporting documents, I have determined that this project, implemented consistent with any of the action alternatives, is not a major federal action and would not significantly affect the quality of the human environment, individually or cumulatively, with other actions in the general area. None of the environmental effects described in the February 2020 EA meet the definition of significance in context or intensity, as defined in by CEQ, and do not exceed effects described in the PRMP/FEIS. Therefore, no further supplemental or additional information to the analyses in the February 2020 EA, nor preparation of an EIS is required. This finding is based on the following analysis:

Context *[40 CFR 1508.27(a)]*

The selected actions are site-specific actions that by themselves do not have international, national, region-wide, or Statewide importance. The actions would be limited in scope and geographic application (40 C.F.R. § 1508.27(a)). The BLM described in the February 2020 EA the project location (Section 1.0), the purpose and need for the project (Section 1.2), and the affected environment (Chapter 3). The BLM analyzed and disclosed the direct, indirect, and cumulative effects of the proposed actions for the issues analyzed in Chapter 3. The physical and biological effects are limited in scope and scale. The direct and indirect environmental effects would range from the project area for the recreation resource, to as wide as the Sustained Yield Unit (SYU) for both the Allowable Sale Quantity (ASQ) and Age-class redistribution. The BLM also followed CEQ regulations on cumulative effects analysis, and disclosed the results in the February2020 EA.

The BLM signed a Record of Decision (ROD) approving the Northwestern and Coastal Oregon Record of Decision and Resource Management Plan (2016 ROD/RMP) on August 5, 2016. The Upper Willamette Field Office designed this project to conform to the ROD/RMP, which is the governing RMP for this project. The proposed action is in conformance with the applicable RMP because it is specifically provided for in the following RMP decisions:

- The proposed harvest action is specifically provided for in the RMP because the underlying land use in the timber harvest areas is Harvest Land Base (HLB), and on HLB lands, the

RMP directs the BLM to implement timber harvest activities in a manner that, repeated over time, results in a sustainable harvest level (RMP, p. 296).

- The proposed trail development action is provided for in the RMP because the RMP directs the BLM to manage Extensive Recreation Management Areas (ERMAs) in accordance with their planning frameworks (RMP, p.88), and the Willamalane ERMA planning framework specifically identifies the opportunity to connect BLM's future trail network in Sections 1 and 31 to a similar network of hiking and mountain biking trails on the adjoining Willamalane Parks and Recreation District (WPRD) lands (Willamalane ERMA Framework, p. 1).

Intensity [40 C.F.R. § 1508.27(b)] I have considered the potential intensity of the impacts that would result from the proposed action relative to each of the 10 factors required for consideration by the CEQ, as detailed below:

[40 CFR 1508.27(b) (1)] - Impacts that may be both beneficial and adverse. The February 2020 EA analyzed environmental effects from the project and presented four issues not analyzed in detail in Section 1.6 and six issues analyzed in detail in Section 3.

Issues were not presented in detail if there would be no potential for significant effects from the proposed action beyond those analyzed and disclosed in the PRMP/FEIS; no potential for significant effects based on the analyses in the EA; and no substantive differences in their effects (beneficial or adverse) to inform the decision maker. These issues included effects of some or all the proposed action activities on the following resources:

Invasive Plants: The BLM evaluated potential changes in invasive plants for the timber harvest action. The BLM would expect invasive plants to increase after harvest, with the increased levels persisting up to about 30 years, at which point planted conifers and other shade-tolerant native vegetation would outcompete (cause reductions in) invasive species. Due to the current prevalence of weeds in the project area, BLM reforestation efforts after harvest would include proactive cutting back of invasive shrubs to promote growth of the planted seedlings. These efforts, in addition to the BLM's implementation of project design features (PDFs) and other monitoring and control actions described in the February 2020 EA, would minimize the increase of invasive species, with rates of infestation remaining high after timber harvest, similar to existing conditions. EA pp. 15-16. Because conditions would not substantively change as a result of the proposed action, there would be no significant impacts from the proposed action on native vegetation from invasive plants.

Trespassing, Litter, Vagrancy, Privacy, Traffic, and Traffic Noise for Residences: The BLM evaluated the effects of the selected trail development action on neighboring residences relative to trespassing, litter, vagrancy, privacy, traffic, and traffic noise. The BLM concluded that undesirable and criminal activities would not increase and may decrease in the project area as a result of trail development. EA pp. 16-18. Relative to privacy, three residences located where the trail corridor could not otherwise be rerouted farther away would be potentially affected by noise or visual effects from trail users, with effects including audible noise, such as the whirring of bicycle wheels, voices, and visual sightings of recreational users. Two of these residences are currently exposed to occasional noise and visual sightings of trail users on user-created trails. The third residence is set back from the trail and has screening vegetation on the property, but the timber harvest action would remove trees near the property, which could increase its

exposure to the trail. The BLM would incorporate aggregate green tree retention along the trail near this residence to provide a forested corridor for the trail to the extent possible. During and after trail construction, the BLM would implement a suite of management measures to enhance security through design, education, and enforcement. EA p. 18. Relative to traffic, the BLM trail development would not result in vehicular traffic on 79th Street because BLM is not proposing trail heads, parking facilities, or other amenities accessible from 79th Street or any other local roads. EA p. 18-19. Based on these considerations, the BLM does not anticipate the changes incurred by the trail development to cause significant impacts to neighboring residences. EA pp. 16-19.

Mature and Late-successional Forest Characteristics and Effects on Spotted Owl: The BLM analyzed effects on the amounts of late-successional forest structural stages and down woody material and the effects on spotted owl recovery in the PRMP/FEIS, to which this EA tiers. PRMP/FEIS pp. 307-337. The proposed project would be consistent with these effects because the proposed regeneration harvest follows RMP management direction, with features detailed in the Section 2.3.2 of the February 2020 EA. The affected stands would develop through the Early Successional, Stand Establishment, Young High Density, and Mature Multi-layered Canopy structural stages, as anticipated by the PRMP/FEIS (p. 318), before the BLM would once again conduct harvest. There are no known spotted owl sites in the proposed project area. EA pp. 19-20. Because there are no known northern spotted owl sites or designated critical habitat in the project area, there would be no significant effects to the species or critical habitat from the proposed action. In addition, the PRMP/FEIS analyzed and disclosed the effects of a timber harvest regime on mature and late successional forest characteristics and their effects on northern spotted owls. This EA is tiered to that analysis. Because there are no effects beyond those disclosed by the PRMP/FEIS, and no individuals of the species or any designated critical habitat in the project area, there would be no significant impacts to northern spotted owls or their habitat. EA pp. 19-20.

Sediment Entering Streams: The BLM previously analyzed effects of sediment yield from road construction in the PRMP/FEIS, to which this EA tiers. PRMP/FEIS pp. 401-409. For the proposed project, the BLM hydrologist conducted a quantitative analysis that included road construction, timber hauling, and trail building on sediment yields. The BLM concluded that the estimated increases in sediment yield from the Thurston Hills project would not be detectable relative to background sediment load. Road building and use, trail building and use, or the combination of road/trail building and use would not result in detectable changes in water quality. EA pp. 20-22. Because there would be no detectable change, there would be no significant impact from sediment entering streams.

The issues presented in detail in the February 2020 EA described both beneficial and adverse impacts. Those findings are summarized below. Note that the ranges provided in the below descriptions reflect the variation in the effects of the alternatives, unless noted otherwise.

Recreational Experiences: The trail development alternatives would develop between approximately 8.3 and 8.5 miles of new designated non-motorized, single-track trails within the ERMA, and an associated designated Recreation Management Zone (RMZ). The trail network would offer a range of trail experiences (play, escape, challenge, and efficiency) and provide for intermediate and advanced opportunities, with a variety of technical trail features including jumps, berms, grade reversals, and rollers on 12 distinct segments of trail. Trail width would be

narrow (24-36 inches) across all trail segments, providing for a challenging and fun experience. When connected to and combined with the adjacent WPRD 12-mile system, the approximately 20 miles of the combined trail system would provide an additional recreational opportunity in the Eugene/Springfield area. EA pp. 38-43. Development of the trail system would follow management direction in the RMP, which anticipated its development. The BLM disclosed in the PRMP/FEIS, to which the February 2020 EA is tiered, the effects of developing the trail system in this area. Because these effects have already been disclosed in the PRMP/FEIS (pp. 555-584), and there would be no additional effects beyond those already disclosed in the PRMP/FEIS, there would be no significant impacts to recreational experiences from this project.

Timber Volume as Allowable Sale Quantity (ASQ): The BLM offered for sale the Pedal Power Timber sale in fiscal year (FY) 2018 under Modified Alternative 4 of the May 2018 EA. ASQ volume from that sale was attributed to FY 2018. It is assumed that if another timber harvest alternative were selected, the additional volume would be sold in FY 2020. If an alternative were selected that would not implement timber harvest, the volume from the Pedal Power Timber sale would be lost from FY 2018.

The timber harvest alternatives would contribute between approximately 4.0 and 6.0 million board feet (mmbf), representing approximately 7.5-12 percent of the SYU annual total ASQ target of 53 mmbf per year. Timber sales planned within the Eugene SYU for the years 2018 and 2020, including the Pedal Power sale, once implemented, would contribute to the ASQ volume. EA pp. 51-53. The PRMP/FEIS and RMP/ROD established an ASQ and disclosed the effects of offering that amount of timber volume for sale in a normal market. Because this proposed action would implement the decision made in the RMP/ROD and does not have any effects beyond those disclosed in the PRMP/FEIS, there would be no significant impacts to timber volume and ASQ from this project.

Forest Stand Age Class Distribution: The timber harvest alternatives would increase the 0 to 10-year age class by 109 to 165 acres and would decrease the 70-year age class by 109 to 165 acres, at the scale of both the Upper Willamette Field Office and the Eugene SYU. The Pedal Power harvest combined with other regeneration harvests in the Upper Willamette Field Office and the Eugene SYU would result in a trend of increased HLB acres in the 0 to10-year age class. EA p. 53-55. Over time, acres in the 0 to 10-year age class would move into the 20 to 40-year age class, and successively into the 40 to 60 age class, for a more even distribution of ages across the age classes, as anticipated by the RMP. EA p. 53-55. The project changes in acreage associated with these age classes (whether measured in raw numbers or as a percentage) are very small relative to the Eugene SYU acreage. The PRMP/FEIS analyzed and disclosed the effects of adjusting the age class distribution across the landscape. Because this proposed action implements the decision made in the RMP/ROD and would not have any effects beyond those disclosed in the PRMP/FEIS (pp. 307-337), there would be no significant impacts to forest stand age class distribution from this project.

Fire Hazard:

Under Alternatives 3, 4, and 5, timber harvest would increase fire hazard in the short-term (0-10 years) at the project scale because of the creation of residual activity fuels. The use of whole-tree yarding and slash treatments would reduce, but not eliminate, this increase in fire hazard. Subsequent reforestation would create stands that would have a Moderate fire hazard initially, followed by a High fire hazard by the end of the short term and during the intermediate

timeframe (10-30 years), followed by a Mixed fire hazard in the long term (30-50 years). Because regeneration harvest is reasonably foreseeable in the intermediate timeframe under the No Action alternative, Alternative 2, and the unharvested portions of the project area under Alternative 4, the same effects on fire hazard would occur under these alternatives, except 10 to 20 years later. Therefore, the effects on fire hazard would be the same under all alternatives, although the timing of these effects would differ. EA pp. 66-73.

However, since the entire project area includes the presence of structures and infrastructure the potential effects on fire hazard would be similar across all alternatives. At the 6th field watershed level, the Thurston Hills project affects less than one percent of the acres within the watershed. These effects from regeneration harvest on fire hazard are within the scope and scale analyzed in the FEIS (pp. 253-264) and therefore, there are no foreseeable significant effects on fire hazard beyond those disclosed in the FEIS.

Fire Risk:

Under all alternatives, including the No Action alternative, overall fire risk would remain Moderate to High at the local scale over the next ten years. EA pp. 55-65. Over this timeframe, there would be some changes among the alternatives in the individual components of fire risk, and these changes differ among the alternatives. The No Action alternative and Alternative 2 would not cause increases in fire risk associated with the hazard component over the next ten years, because they would not include timber harvest. Alternatives 3, 4, and 5 would cause increases in fire risk associated with the hazard component, because timber harvest would create fuels and change the forest structural stage. Alternatives 3, 4, and 5 would also cause decreases in fire risk associated with the protection capability component because of increased access. Alternatives 2, 3, and 4 would increase public use and thereby increase the likelihood of early notification in the event of a wildfire, increasing the probability that suppression efforts would be successful.

The magnitude of these changes in the individual components of fire risk are not sufficient to alter the overall fire risk category at the local scale over the next ten years for any alternative. As a result, neighboring homeowners would continue to experience the same overall fire risk over the next ten years that they currently experience under all alternatives.

The effects from regeneration harvest and trail creation on fire risk are within the scope and scale analyzed in the FEIS (pp.253-271) and therefore, there are no foreseeable significant effects in the fire risk beyond those disclosed in the FEIS.

[40 CFR 1508.27(b) (2)] - The degree to which the Proposed Project affects public health or safety: The proposed trail development actions would be neutral or beneficial for public health and safety, providing outdoor recreational opportunities associated with health benefits. Public safety associated with the trail development actions were assessed through the issue analyzed in detail in the February 2020 EA, "trespassing, litter, vagrancy, privacy, traffic, and traffic noise", and the BLM determined there would be neutral or positive effects. EA pp. 16-19. The timber harvest actions would be implemented following all Occupational Safety and Health Administration (OSHA) safety regulations, such as: temporary road closures would be implemented on Road No. 18-2-1 (extension of 79th Street) during timber loading and road work to keep people at a safe distance from active operations (EA p. 30); and snags would not be

created within falling distance of power lines, structures, roads, or trails that will remain open after harvest activities (EA p. 29). The BLM would continue to monitor and respond to public safety and would implement all necessary safety precautions during project implementation. Because the BLM would implement safety measures during project implementation that would help ensure public safety, there would be no change from the current conditions. Thus, there would be no significant impacts from these proposed actions on public health or safety.

[40 CFR 1508.27(b) (3)] - Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas: There are no unique characteristics of importance in the Thurston Hills project area. The BLM conducted a cultural resource inventory of the project area in July 2017, and no cultural resources were identified. Because there are no known cultural resources or other unique characteristics of the geographic area in the project area that could be affected by this project, there would be no significant impacts.

[40 CFR 1508.27(b) (4)] - The degree to which the effects on the quality of the human environment are likely to be highly controversial: CEQ regulations relating to controversy do not refer to the amount of public opposition or support for a project, but rather, to a substantial dispute as to the size, nature, or effects of the proposed action. The effects of activities planned under the proposed actions are like many other trail development and timber harvest projects of a similar size and type implemented by the BLM in Northwest Oregon. There are no unique or appreciable scientific controversies regarding the effects of the project. Accordingly, here, there is no substantial dispute as to the size, nature, or effects of the proposed action that would be highly controversial.

[40 CFR 1508.27(b) (5)] - The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks: The proposed action would not impose highly uncertain impacts or involve unique or unknown risks to the human environment. The effects of activities planned under the proposed action are like many other trail development and timber harvest projects of a similar size and type implemented by the BLM in Northwest Oregon. The risks are well known and understood, and not highly uncertain or involve unique or unknown risks.

[40 CFR 1508.27(b) (6)] - The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration: This project neither establishes a precedent nor represents a decision in principle about future actions. The proposed trail development actions are consistent with the BLM management direction for recreational facilities, would not cause significant environmental effects, and would not establish a precedent for future recreation actions with significant effects. The proposed timber harvest actions are consistent with the BLM management direction for forest management, would not cause significant environmental effects, and would not establish a precedent for future actions with significant effects. Therefore, the proposed action would not be significant under this factor.

[40 CFR 1508.27(b) (7)] - Whether the action is related to other actions with individually insignificant but cumulatively significant impacts: The BLM evaluated the project in context of past, present, and reasonably foreseeable actions and determined that there would be no potential

for significant cumulative effects. Indeed, the BLM identified that the proposed action would have local and regional positive cumulative effects relative to recreational opportunities in the Eugene/Springfield area, timber volumes (in ASQ), and forest age class distribution. These effects would be consistent with the local and regional settings considered in the analyses.

The February 2020 EA considered other reasonably foreseeable actions for the issues analyzed in detail. The proposed trail actions would provide a new recreational opportunity in the Eugene/Springfield area as anticipated by the RMP, and in combination with the current and future WPRD trail system, would provide a well-constructed and sustainable local recreational facility into the future. EA pp. 38-43.

The timber harvest actions would provide for approximately 4.0-6.0 million board feet of ASQ, which would be combined with other timber sales in the Eugene SYU to provide enough timber volume to meet the annual ASQ targets for the Eugene SYU (53 mmbf per year). EA pp. 51-53. The timber harvest actions would redistribute approximately 100-155 acres into the 0 to 10-year forest age class, and, combined with future harvests across the Eugene SYU, would cause a more even distribution of ages across the age classes, as anticipated by the RMP as a means to provide sustained yield harvest levels. EA pp. 53-55. These actions would have beneficial cumulative effects relative to BLM's ability to manage forests for sustained yield, as anticipated by the PRMP/FEIS.

[40 CFR 1508.27(b) (8)] - The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources: The proposed actions would not affect any cultural resources listed in or deemed eligible or potentially eligible for listing in the National Register of Historic Places. The BLM conducted surveys in 2017, and no cultural resources were identified in the project area. EA p. 14. Because there are no known cultural resources that could be affected by the proposed action, there would be no significant impacts on these resources.

[40 CFR 1508.27(b) (9)] - The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act (ESA) of 1973: There are no species listed or proposed for listing under the ESA in the project area, and no designated or proposed to be designated critical habitat in the project area. EA p. 65. Therefore, the proposed action would have no significant effects to such species or their critical habitat, and therefore, there would be no significant effects to these resources.

[40 CFR 1508.27(b) (10)] - Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment: The proposed action does not violate or threaten to violate any federal, State, or local laws imposed for the protection of the environment.

Conclusion

Based on the information contained in the February 2020 EA (DOI-BLM-ORWA-N050-2017-0006-EA), and all other information available to me, I have determined that the proposed action would not have significant impacts on the quality of the human environment within the meaning of Section 102(2)(c) of the National Environmental Policy Act of 1969, and that an EIS is not

required. In addition, I have determined that the effects of the proposed activities would be in conformance with the management direction of the RMP/ROD.

Signature of the Responsible Official:

Rebecca Brooke Upper Willamette Field Manager Northwest Oregon District Office	Date